THE DAWN OF MIND

AN INTRODUCTION TO CHILD PSYCHOLOGY

BY

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PREFACE

For the sake both of theory and of practice, child psychology should bulk more largely in our thought and in our literature than it does.

There are numerous problems of general psychology which can, it seems to me, be most readily solved by a close study of the developing mind as it appears in the child. A series of careful records of the mental growth of individual children would in this connection be of the greatest value. Such records can be made only by one who is constantly in the most intimate contact with the child; by one who can at the same time assume the scientific attitude, and who has some acquaintance with scientific method. A psychological training is also essential, otherwise many illuminating incidents will be passed over.

Not many people fulfil all these conditions. The only person who really fulfils the first is the child's mother or nurse, and she seldom has the knowledge and mental training which are equally necessary.

Fully equipped women are, however, becoming more numerous every day, and we may look with confidence to the mothers of the future for the material we require.

The chief records at present available are Miss

Shinn's careful study of her niece from birth, and Professor Preyer's pioneer work on the development of his little son.

My own notes on my little niece Margaret, together with the published accounts of those two children, Ruth and Axel, have supplied most of the facts on which this contribution to child psychology is based.

Professor Sully's charming "Studies of Childhood" I have also found useful, especially the "Notes from a Father's Diary" which record, only too briefly, the development of Clifford.

The other children referred to are for the most part little friends of my own.

The account of the development of the imagination diverges considerably from the theory generally held. In this region much work still remains to be done. My belief is that in many, possibly in most cases, visual imagery develops slowly. The child neither draws nor builds nor models from a copy in his mind. He manipulates the material sometimes haphazard, and gets a suggestion from the result.

This is a mere sample of the kind of question on which a minute study of child psychology may be expected to throw light.

The practical need for a study of child psychology is even more pressing than the theoretical. All lovers of little children have welcomed the recent proposals for the establishment of nursery schools. If, however, the teachers in these schools are not thoroughly versed in child psychology and in the methods of teaching which are naturally founded upon it, there are two grave dangers to be feared.

If the school is regarded simply as a nursery, no use may be made of the enormous capacity for intellectual growth and assimilation of knowledge that characterises the third, fourth, and fifth years. Such a school, while lacking the often objectionable character of a street environment, might prove even more cramping to the developing intelligence.

On the other hand, if the school is thought of as a place where children sit quietly in rows and receive instruction, the working out of this idea may lead to even more fatal results.

To find the safe, middle path between these two dangers, the teacher must be equipped with the fullest knowledge of child nature that is yet available. To teach the little people as they ought to be taught and deserve to be taught, to preserve their spontaneity and keep their eager interest alive, is no easy task; but if this task were well done it would make an incalculable difference to the work of the ordinary school, and in the end to the life of the nation.

M. D.

REFERENCES FOR READING

"Notes on the Development of a Child." Millicent W. Shinn. University of California Studies.

"Studies of Childhood." James Sully. Longmans, Green and Co.

"The Mind of the Child." W. Preyer. International Education Series.

"The First Three Years of Childhood." Bernard Perez. Sonnenschein.

"Studies in Education," ed. Earl Barnes.

"The Dawn of Character." E. E. Read Mumford. Longmans, Green and Co.

"An Introduction to Child Study." W. B. Drummond. Edward Arnold.

"Mentally Defective Children." A. Binet and Th. Simon. Edward Arnold. The "Binet Scale" is given as Appendix to this book.

"A Study of Children's Vocabularies." James Drever. *Journal of Experimental Pedagogy*, Vol. III.

"A Child's Progress in Speech, with Detailed Vocabularies." W. G. Bateman. *Journal of Educational Psychology*, June, 1914.

"Two Children's Progress in Speech." W. G. Bateman. *Journal of Educational Psychology*, October, 1915.

For the interesting and instructive papers by Mr. Homer Lane and Miss Crouch referred to in Chapters V., VII., and VIII., see the Report of the Conference on New Ideals in Education held at Stratford-on-Avon, August, 1915.

CONTENTS

CHAPTER I

THE PHYSICAL BASIS

CHAPTER II

EARLY CONSCIOUSNESS: ABSORPTION

CHAPTER III

EARLY CONSCIOUSNESS: EXPRESSION

CHAPTER IV

SOME FUNDAMENTAL CONCEPTS

CHAPTER V

THE UNLUCKY BABY

CHAPTER VI

MEMORY, IMAGINATION, AND PLAY

CHAPTER VII

SYMPATHY, SUGGESTIBILITY, AND SELF-CONTROL

CHAPTER VIII

REASONING

CHAPTER IX

LANGUAGE: SPOKEN AND WRITTEN

CHAPTER X

CONCLUSION

THE DAWN OF MIND

CHAPTER I

THE PHYSICAL BASIS

BIRTH is not the beginning of existence; it is a crisis in existence. It is a great adventure.

The new and much more complex environment demands new adjustments. Hitherto the child's blood has been aerated, his body has been nourished, by the work of the mother. Now he must breathe for himself; he must take in and digest his own food. If such necessary adjustments are not made, the adventure fails. At its very threshold life gives place to death.

Should the first difficulties be surmounted and independent existence established, growth proceeds rapidly.

The growth of the whole body is largely regulated by the nervous system. A brain injury at birth may, for example, result in paralysis and underdevelopment of any of the limbs.

Such an injury may also interfere with mental development to a greater or less extent. A child so injured may grow up an idiot or an imbecile.

Upon the integrity of the nervous system, therefore, everything depends.

The Nervous System.—The Nervous System is made up of the Brain, the Spinal Cord, and the Nerves.

The brain is a mass of soft matter which occupies the upper and back portions of the head, and is surrounded and protected by the smooth hard bones of the skull. Two parts are easily distinguished—the large cerebrum filling the upper part of the cavity of the skull, and the smaller cerebellum below it. The outer surface of the cerebrum is thrown into folds known as convolutions. This outer surface is light grey in colour, whereas the interior is white. This grey outer surface is known as the cortex. Certain little isolated masses of grey matter are found in the interior of the cerebrum; grey matter also forms the central core of the spinal cord.

The spinal cord is a long thin cylindrical mass enclosed within the vertebræ of the spine. It is continuous with the brain through a hole in the skull.

The nerves are white cords which come off from the brain and spinal cord. Those from the brain pass through small holes in the skull, and ramify in the sense organs, muscles, skin, and other structures of the head. Those from the spinal cord pass between the vertebræ, and ever breaking up into finer and finer branches are distributed to every part of the body.

The minute structure of these several parts of the nervous system is extremely complex, and quite imperceptible to the unaided eye. Only after the invention of the microscope did it become possible to ascertain the facts.

The structural unit of the nervous system is now known to be the neurone, consisting of a little nucleated mass of protoplasm with countless fibres coming off

therefrom. As a rule each neurone has one specially long filament which is known as the axis cylinder or axon. The central masses or cell-bodies are found chiefly in the grey matter of the brain and cord. They are exceedingly numerous. It has been calculated that there are three thousand million of them in the cortex alone.

The nerves are made up of bundles of axons. They appear white, because each axon is enclosed in a white protective sheath. These axons are continuous throughout their whole length, which may be as much as four feet. Each forms an integral part of its own neurone, and would perish if separated from it.

General Arrangement of Neurones.—The neurones are arranged in at least three different tiers or levels. Comparatively few of them contribute filaments to the nerves which supply the periphery of the body. Those which do so are said to belong to the first level. Their cell-bodies are located in the cord and in certain "lower" regions of the brain, *i.e.* not in the cortex.

The neurones of the second level are found in certain areas of the cerebral cortex. Their axons enclosed in white sheaths pass out of the cortex and make up the white matter of the brain and cord. They thus connect the two levels.

Within the cortex are countless neurones whose filaments do not pass out from the cortex at all. They are superposed upon the second level in such a way as to form connections between different regions within it. They are known as neurones of the third or association level.

Some neurones must form connections altogether

within the association area, but no purpose is served by distinguishing more than three levels.

Functions of the Nervous System.—It has been said that the nervous system regulates growth. It also directs nutrition. The processes of digestion are initiated and controlled by nerve mechanisms.

Indeed all the activities that are going on from moment to moment in the body come under the influence of the central nervous system. The beating of the heart, the contraction and expansion of the chest, the secretions of the various glands, the tone of the muscles, the condition of the blood-vessels—in a word, the ceaseless changes which make up the life of the organism—are all regulated by the nervous system.

The function of the nervous system may then be said to be to unify the body, to secure that all parts shall act for the good of the whole.

The first necessity of life is food. Hence movements must be directed somehow by the position of food relatively to the organism. This is accomplished by means of the nervous system, which in its simplest form merely serves to connect the sense-organ by means of which food is perceived, with the muscles by means of which suitable movements are brought about.

The nature of the neurones is such that impulses can pass along their fibres only in one direction, either towards the centre or towards the periphery. The neurones which convey impulses towards the centre are termed sensory or afferent: those which convey impulses towards the periphery are termed motor or efferent.

To connect sense organ with muscle it is obvious that at least one of each kind is required. Such a combination

is termed a sensori-motor arc, and may be regarded as the functional unit of the nervous system.

Reflex or First Level Activity.—Nervous activity, such as has just been described, clearly implies only one level. More than two neurones may be concerned, but they must be arranged as a chain. The connection between the sense-organ (skin, eye, ear, etc.) and the muscle is direct.

Such activity is found in the human organism, and is termed Reflex Action. Only the lowest level of neurones is required for it.

Children frequently amuse themselves by thrusting out a fist close to the eye of a companion in order to see him wink. The wink takes place before the threatening body has been perceived. The movement is brought about by motor neurones of the first level, whereas perception does not take place until the stimuli passing along the optic nerve have reached the third level.

Analogous movements may be obtained by gently stroking the sole of the foot.

If one passes from a dark room to a bright one, the size of the pupil of the eye diminishes. This is a direct muscular response to the increased stimulus applied to the eye; that is, it is also an example of reflex action.

To early observers it seemed in such cases as if nervous activity passed to the centre and was reflected back, just as a ball rebounds when thrown against a wall. Hence the name Reflex Action.

The reflex response is never delayed. The nervous impulse travels very quickly, so that in the case of the reflex wink, for instance, we are aware of the movement practically as soon as we are aware of the stimulus.

The reflex response varies very little in character. When the stimulus is applied, we know exactly what movement to expect.

On the whole, the activity may not unfairly be compared to a mechanical one. Press the button, and the bell will ring, or the light will appear.

Higher Level Activity.—A delayed response or a variable response implies nervous activity on the higher levels.

Very often a child is stimulated and gives no response. Yet long afterwards we may trace that stimulus in his activity.

I was walking with a three-year-old child along a road by the side of which were some dried leaves. "What a nice rustling noise they make when you tread on them," I remarked. The child took no notice of my words at the moment; yet some three weeks later in similar circumstances she spontaneously remarked, "What a nice rustling noise the leaves make when you tread on them, don't they?"

I do not think it at all likely that the child really remembered the previous incident, or had any idea that her comment originated not in the present only. But somehow or other she had preserved my words, and when similar stimuli played again upon her nervous system out came those words as the response.

These processes of preservation and association will meet us again and again in our study of child life.

So far we have looked at activity objectively. Yet we know that in such a case as the above the inner or subjective side of the nervous activity is the important one. The child *heard* and *understood* my remark though she

gave no outward sign. Nervous activity of the higher levels is accompanied by such mental processes as seeing, hearing, feeling, understanding, in a word, by consciousness.

We are all familiar with the fact that bodily movement can be brought about by conscious processes. We can assume any position that we choose; we wish to pick up something, and we find ourselves stooping. Such conscious processes as choosing, wishing, and many others conveniently embraced under the term volition, result in various movements suited to the end in view. These processes denote activity of the neurones of the cerebral cortex.

But before bodily movements can result from this activity, impulses must pass along the nerve fibres to the neurones of the first level. Since they are the only neurones which have nerve endings in the muscles, through them must the higher neurones work. Unless this physical connection were intact, we might wish and will to any extent, but our body would not respond. Thus, while muscular movement may be initiated in various ways, its immediate cause is always the flow of nerve impulses along the motor fibres of the first level.

Hence these fibres are sometimes spoken of as the *final common path.*

So far as our present knowledge goes, no consciousness accompanies the activity of the neurones of the first level. Yet in the case of reflex action we are frequently aware both of the stimulus and of the responsive movement. How is this?

Take the reflex wink, for example. The nerve impulses aroused by the approach of the threatening body

are only partially transmitted at the first level to the motor neurones. Some find their way along a chain of sensory neurones to the cortex; the nervous disturbance set up there is accompanied by sensation—we see the fist. In a similar way do we become conscious of the movement. In the muscles and in the tendons sensory nerves have their endings. These endings are excited by the contracting of the muscles, and there are propagated along their fibres impulses which finally reach the cortex, and give rise to sensation.

A willed movement, as we have just seen, originates in the cortex. Such a movement is usually very complex. It consists, indeed, of a number of different movements all adjusted to one another in such a way that some particular purpose may be served. In the act of writing, for example, the thumb and fingers assume and maintain certain positions; there are movements of the wrist and movements of the arm; there are head movements and movements of the eye; and all these movements are co-ordinated to serve the end in view.

How is this co-ordination maintained?

Such a movement is regulated throughout its whole course by the incoming nerve currents started by the movement itself. From moment to moment these determine the innervation of the various motor neurones so that exactly the needed stimulus is sent to each muscle taking part. During the whole course of a co-ordinated movement nerve impulses are continually shooting up to the centres to indicate the precise stage of proceedings; as continuously impulses, adjusted so as to bring about harmonious co-operation in the achievement of the end, shoot down from the centres to the muscles. Even

opposing muscles are thus made to assist one another; when one muscle contracts its opponent relaxes, not suddenly, but gradually, in such a way as to steady the whole movement.

Particular Arrangement of Neurones; Brain Centres.—Every one nowadays knows that we think with our brain; but no one who has not studied physiology knows what a marvellous instrument our brain is, how part is fitted to part, and how each part is specialised for its own work.

We have seen that the neurones are arranged in different levels, and that intercommunication takes place by means of the fibres which pass from one level to another. Within the levels there is division of labour and diversity of function. Groups of nerve cells work together in connection with the various activities of the body and of the mind. Such groups are known as centres. There is a breathing centre which takes up its work at birth. There is a speech centre which gradually learns to perform its duty—the regulation of the muscles required for speech—during the first few years of life. There is a centre in intimate connection with each of the special sense organs, and sense experience is dependent on the development of these centres. Thus "seeing" implies not only integrity of the eye, but of the nerve fibres connecting it with the brain, and of the brain areas which are active in the act of seeing. To educate the eye is really to educate the brain; it is to accustom certain parts of the brain to act in harmony so that sight sensations acquire meaning; to learn to draw is to learn to correlate sight sensations with definite movements. We are establishing nervous connections; we

are, as it were, marking out paths for the nerve impulse to follow.

Ask a child of three or four to thread a needle. Show him how to do it. He understands quite well, but he cannot perform the task. His hand cannot direct the thread so that it will pass through the eye of the needle. It is not strength that is lacking; it is skill. The child has not learned to call forth the nerve impulses which would give rise to exactly the right movement. There is no path laid down between the sensory area active in seeing and the motor area which would send forth just the required impulses to the muscles of the hand.

It is well to be able to think of the process of education in terms of brain centres and brain paths, for it gives us greater sympathy with childish difficulties and childish clumsiness. Many things which seem easy to us are impossible to the child because of his unfinished brain. His clumsiness is no matter for reproof: it merely means the instrument he is using (his brain) is not yet one of precision.

This conception should also give patience. A brain path is not established by one successful passage of the nerve current. When we thoroughly know this, we shall cease saying to the child, "You did that right yesterday, why do you pretend you cannot do it to-day?"

All the higher mental processes, perception, conception, memory, imagination, reasoning, involve the activity of brain cells in the third level. This region of the brain is sometimes known as the Association Area. It includes about two-thirds of the cortex. Very

probably it also is divided into centres, but as yet we know little of its topography.

The Condition of the Nervous System at Birth.—At birth, the nervous system is already furnished with the neurones that will last it through life. No more than we can add a cubit to our stature can we increase the number of brain cells with which nature has endowed us. But many of these are very imperfectly developed, and large areas of the brain are not ready to function.

The lower levels, as is to be expected, are the most advanced. Reflex movements are obtained, showing that certain nerve paths are already established. Even before birth the swallowing reflex has taken place, and immediately after birth the sucking reflex can be obtained in the overwhelming majority of infants by merely placing a finger between the lips.

The full development of the sensory centres in the second level is dependent on sensory stimulus. The nerve fibres which conduct the stimuli are not supposed to function until they are *medullated*, or enclosed in their white protecting sheath. This process of medullation in the case of the fibres leading to the cortical centres begins before birth, but is far from complete at birth. Only a limited number of the host of new stimuli which immediately after birth seek entrance by means of eye, ear, mouth, nose, skin, can penetrate to the cortex. Thus the baby is guarded from any sudden increase of cortical activity. After birth medullation continues rapidly and multiplies the lines of access to the cortex.

The size of the brain is said to increase by 1 cubic cm. every day during the first year. Every mother knows

how quickly baby grows out of its first little hats or bonnets.

The Association Centres are not ready to function at all, as no association fibres are medullated. Only isolated sensation experiences are possible without the help of these centres.

CHAPTER II

EARLY CONSCIOUSNESS: ABSORPTION

Consciousness of the Newly-Born.—Only by a strong effort can we conceive the consciousness of the newly born babe. We may compare it with a flickering dawn, when we find it hard to say at what moment the first faint modification of darkness made itself perceived. Everything in it is dim, shifty, tentative. In it are no sounds, no colours, none of the clear experiences that stand out so strongly in the adult mind. As the world in the beginning was without form and void, so is the nebulous consciousness of the babe.

Certain organic sensations, chiefly hunger, thirst, and, upon occasion, internal pain, are fairly distinct. Sensations of position and of equilibrium are also experienced. Movements of the eyes, lips, tongue, and neck are felt, but probably not those of the trunk and limbs.

Special Sensations.—*Sight.*—For the first few days the baby sleeps most of the time, but it is probable that when his eyes are open he has a dim sensation of sight. Mild light seems to be pleasant from the first, strong light unpleasant. Light and darkness are different experiences. Colours are not distinguished, nor are the forms of objects. Learning to see is a long process.

Hearing.—All children are deaf for a few hours or even days after birth. It is quite possible that deafness, that is, the absence of sound sensations, may continue for the first two or three weeks. The child may react to a sudden and startling noise, but he probably experiences it as a jar rather than as a sound.

Taste and Smell.—Even in the adult, touch and temperature, taste and smell all contribute their quota to our complex taste experience. It is therefore difficult in the case of the infant to isolate a taste stimulus so as to be sure that any response obtained, such as change of facial expression, indicates taste sensation. If we judge from the baby's behaviour, any moderate taste stimulus, even a fairly strong solution of quinine, is pleasant; a very strong stimulus is unpleasant, giving rise to grimaces and movements calculated to get rid of the offending substance.

If we experiment with odorous substances we get reactions which are very similar to those obtained from taste stimuli.

Under normal conditions there is probably no smell experience. It is also probable that early smell experience is confused with taste. It is only by slow degrees that the two senses are differentiated.

Touch, Temperature and Pain.—Sensibility to touch is present at birth. It is, however, dull, except about the face, the palms, and the soles. Cold is felt as unpleasant. Sharp stimulation of the skin is felt as contact, but for the first few days there is probably no true pain experience.

Thus from the very beginning there are differences of quality within experience, and also differences of affective

tone. There is, however, nothing that we should call knowledge. The sensations are isolated. They have no meaning. The baby does not even know his own body. He has sensations when his head rolls about, but as with all his other sensations he is quite unable to find any significance in them. They are to him merely obscure sensations, not head movements, for he does not know he has a head.

Early Mental Progress.—Our knowledge of early mental progress is inferential. We know something of the nature of mentality in the adult, towards which that of the child is tending. We know something of the structure and rate of development of the brain. We can observe the responses which the child makes to the environment; we can even experimentally modify the environment so as to test any conclusion we found on such responses.

Thus we have plenty of material to work with.

But it is very easy to go wrong, for we have a tendency to see the adult in the child too soon. We frequently overestimate his intelligence, for example, by taking for granted he has reached a correct conclusion in a correct way. The processes of his thought are hidden from us, and are often very different from what we fancy. Even his sense experience need not be the same as ours, and is certainly not the same for an indefinite period.

Hence we must proceed cautiously, and test and retest our inferences.

Even with respect to the facts we have need of many more exact records of child behaviour.

The first marked stage in mental development is

greeted by the mother as "taking notice." The term is a happy one. It marks the time when the baby begins to distinguish persons, to welcome those with whom he is intimate with smiles and demonstrations of pleasure, to cry at a strange face or a strange voice, to watch with apparent attention all the activities going on round him. Sensations are acquiring meaning.

What does this acquisition of meaning imply?

We may distinguish two processes here. First of all, within each sense, there must be an increase of discrimination. Differences and likenesses begin to stand out. Secondly, experiences derived from different senses come to be associated, so that, for example, the sight of the bottle gives promise of food.

Learning to See.—The sense by which we learn most is probably sight. It is also the sense in which it is most easy to analyse the process of education.

Until one can focus one's eyes on an object one can have no clear image of that object.

Until one can keep a moving object in view by appropriate movements of the eye and head one cannot realise that objects have a continuous existence.

"Taking notice" means the development of these powers, along with the beginnings of memory in the form of recognition.

A close observer can distinguish several stages in a baby's progress towards seeing before he actually "takes notice."

We are all familiar with the steady, placid gaze of the young baby. With eyes nearly, if not quite, "blind as gems," he passively lets light stimuli play upon his nervous system. A mechanical (reflex) tendency to turn

the face towards the light is sometimes seen. Sight consciousness at this period is probably not much greater than our own when our eyes are closed. We can distinguish light and darkness, but we cannot make out objects.

Symmetry of the movements of the eyes is generally fairly well established at birth, or soon after. Yet occasional, irregular eye movements, *e.g.* squinting, are frequently observed.

About the end of the first fortnight brightly lighted objects seem to hold the baby's eyes. In order to see clearly we always direct our gaze full upon an object. This results in the image falling upon the central part of the retina, the fovea, which is more highly specialised than the rest. The differentiation of the fovea probably takes place after birth, and this early staring may show that the central part of the field of vision is beginning to be the most distinct.

Moving objects, particularly faces, which appeal by reason of their brightness, begin to stand out from the background. These moving things enter and leave the child's field of vision frequently and irregularly. Gradually baby finds out that by means of eye movements and head turnings he can keep them longer in view.

The nervous connection which brings about these appropriate movements is laid down by nature at birth, or soon after. A baby has been known to follow a very bright moving object with his eyes as early as the second day. But there is nothing of intention or purpose in such an act—no more than we can suppose is exhibited by a plant which also seeks the light. An important step has been taken when the "following" is purposive.

About the end of the first month the child advances another step. When objects appear in the margin of his field of vision he begins to turn his eyes and head, so as to bring them into the centre. This shows that association paths are being formed in the nervous system. Sensory stimuli are producing adaptive movements. The sensory centre for vision and the motor centre for eyes and head are being joined up.

The baby's mental activity and interest now become very noticeable. He loves to be carried about the room so that he may study it from different points of view. If he is taken into a room new to him he cranes his neck and turns his head about with the utmost eagerness. His expression is one of surprise. His excitement is sometimes so great that a fit of crying may result from the strain and relieve the nervous tension.

We may say that the child has now gone to school, and that the strange shifting shapes he sees form his first lesson-book. He certainly works hard to construct his world—to render his experience intelligible. Hence it is a fatiguing time for him, and he should not be encouraged to remain awake long at a time.

To follow his progress and to realise his difficulties we must use our imagination.

The Baby's World.—What is the baby's world like at this stage?

It is beginning to have objects in it; but these objects have no clear outlines. Moreover they are constantly changing their shapes. Not only that, but their size varies in the most incomprehensible and interesting way. Mother's face at one moment fills the whole of the field of vision, and at another is merely a bright spot.

Objects are constantly vanishing or suddenly appearing. As the faint beginnings of memory stir within him, the appearance of certain objects comes to give him pleasure. We hail the signs of his pleasure as recognition; but it is scarcely this at first in the full sense of the term.

For the first six months we may be pretty sure there is no colour in Baby's world. All of these shifting shapes which we have tried to imagine are black, white, or grey During the second six months colour sensation may be beginning, but not until the second year does it become at all prominent.

Further Progress.—Towards the end of the second month accommodation of the eye, according as the gaze is fixed on an object close at hand or a few feet away, may be looked for. The increasing clearness of objects is shown by the fact that the child now begins to study faces with earnest attention.

Early in the third month Margaret, who was taking a bottle from her mother while I was sitting close by, turned her eyes from the one face to the other with the most scrutinising expression. It was as if she was just realising that we were two different people.

Miss Shinn records a very similar instance at the end of Ruth's eighth week.

As accommodation improves and control over eye movements is established, objects come to be more clearly outlined.

The child begins to form some rudimentary notions of distance from the sensations he experiences when being carried towards objects now becoming familiar to him.

Certain visual sensations begin to give rise to expectation.—Thus if the mother is seen from behind, baby may show that he recognises her, and desires to see her face.

That the child is "taking notice" is generally quite apparent to every one by the fourth month. The mother may see evidence of it in the second month or even earlier.

The Second Process in the Acquisition of Meaning.—All this time we have as far as possible avoided reference to the second process distinguished on p. 16. Seeing means much more to us than a clear perception of outline. Indeed, in later life we do not see a shape as it actually is, but as we know it to be. Thus we say that we see that the top of the table is square, though actually we see it as a diamond. Again things look to us smooth, rough, hard, soft, heavy, light, none of which qualities can be distinguished by vision proper.

Seeing does not suggest all these qualities to baby until he has associated tactile and muscular experience with his visual experience.

Mechanical Nature of Association.—Association between experiences of the different senses, like that between sensation and movement, takes place quite mechanically. Such associations are always established when two sense experiences frequently occur together. Nevertheless, when baby is learning to deduce tactile from visual sensation, that is, when he is just beginning to grasp a thing when he sees it, he often does real intellectual work; and fits of crying may occur which are due to nothing else but mental fatigue.

Early Touch Experience.—Touch experience may be said to be continuous. The constant handling of the baby and the pressure of his clothes on his skin are always giving rise to touch sensations. The lips and tongue are the most sensitive region, and there seems to be a natural tendency for the movements of the arms to be such as to bring the hands often to this region. This is noticed in the first three weeks of life.

Active touch, which combines muscular sensations with those of contact, seems to begin with the tongue and lips rather than with the hand and fingers. Towards the end of the second month Baby may be seen amusing himself by moving his tongue and lips over each other, evidently enjoying the sensations thus produced.

Active touch with the hands follows almost immediately. Baby begins to rub his hand backward and forward on the tablecloth when sitting at table on mother's knee. He does not generally watch his hand, as he has not yet realised quite how the sensations come to him. He seems to be performing the action in an absent-minded way. Yet he is really giving his full attention to the sensations.

In the latter half of the third month he intentionally grasps anything with which his hands accidentally come in contact, and very soon after he begins a habit which continues for a long time—that of putting everything he can in his mouth.

The hand itself is often put in the mouth, and a habit of thumb-sucking may be formed.

Sometimes one hand will take hold of the other and carry it to the mouth. The touch experience here is

different from what it is when other objects are seized, for sensation is roused in both the active and the passive hand. Hence such an incident will tend to wake special attention.

Occasionally there is apparent co-operation between the two hands, but this co-operation is not marked until after some connection has been made between sight and touch, and till baby has learned some important facts about his own hands.

Establishment of Association between Sight and Touch.—All this time Baby has not paid any special attention to his own body. He has not realised yet that he has a body. About the fourth month he discovers his hands, and may often be seen studying them attentively.

It is easy to see how interesting these strange white objects must be to him. Their shape is always changing, but, of course, that is true of many things. Their size changes too as they move about, but that again is a commonplace. What is remarkable is that their movements are always accompanied by other sensations (muscular), and what is more remarkable still, and altogether delightful, is that he finds he can bring these objects into view whenever he likes, and can himself make them take on different shapes and sizes. No wonder we often find baby scrutinising his hands while moving his little fingers to and fro.

When he sees his hands come in front of or alongside some other shape, he often gets touch sensations already familiar to him. He grasps as he is already accustomed to do at the instance of these sensations, and results are in accord with his expectations.

From this it is but a step to reach forth at the prompting of the visual sensations alone. Very often he is rewarded by being able to grasp something, that is, he gets his beloved touch experience.

Sometimes, of course, he is disappointed, as when he reaches for the moon, but by slow degrees he does learn to judge pretty well from the look of a thing whether it is worth while stretching for it or not.

Much practice is, of course, necessary, and during the next few months or years the little scholar works hard at his lessons in translating sight sensations into touch meanings. He works so hard that in course of time it is quite an effort to him to see things as they appear; so much does the meaning overshadow the sensation. See p. 20.

Increase of Knowledge of the Body.—The hand rather than the eye gives us what we consider the real shapes of things. Baby should be kept supplied with simple objects to feel—things that he may safely refer to his lips and tongue—still the favourite touch organs. Mother's face is an attractive toy, and if allowed the little velvety fingers will explore every corner of it. Baby's own face and head are also diligently studied, sometimes with results not altogether pleasant. About the third month Margaret would sometimes scratch her face so violently as to draw blood. This practice ceased before the end of the fourth month.

It is a great day for baby when he discovers his foot. To put his toe in his mouth—a feat which the comparative shortness of his legs renders easy to him—is a source of immense satisfaction. This occurs often about the sixth month.

Exploration of the body continues to be pretty frequent with some children until the end of the first year.

Even by that time baby does not know his body well enough to localise touches or knocks. His sense of pain is not acute, and any pain given by a scratch or bump seems to pass away almost immediately. Even a running child pays scarcely any attention to bumps, unless in the case of a fall that interferes roughly with his activity. Margaret in her second year knocked her head pretty sharply when engaged on some investigation. She gave a cursory rub to the *other* side of her head and continued her employment.

The Looking-glass Baby.—Looking at his own image must help Baby very much in coming to the realisation of his bodily self.

At first the mirror is attractive only because it is bright. Baby gazes at it with no more interest than he would at some shining picture on the wall.

Axel took no notice of his image till the seventeenth week, when he studied it gravely as if it were a strange face. Three days later he laughed to it. In the twenty-fourth week he looked at an image, not himself, and turned to find the real object.

Margaret was either so non-committal or so inconsistent in her behaviour that it was difficult to know what were her views of the looking-glass baby. In the tenth week I held her up to the mirror. Twice she cried, the third time she smiled, the fourth time she cried, the fifth time she would not fix her eyes on the image.

In the thirteenth week she regarded herself with solemn attention, and she smiled to my mirrored face as

it nodded out to her. In the seventeenth week she was held in front of a standing mirror so that she saw herself full length. She smiled and made inarticulate noises to the image with glee. Two days later she suddenly caught sight of her own image in the same mirror and began smiling and "talking" to it.

Axel in his fifty-seventh week turned the mirror round as if to find the child, but I never saw anything to suggest that Margaret ever thought there was another child there.

Development of the Other Senses.—From the point of view of intellectual development sight and touch are the most important of the senses. Baby, like the wise little person he is, shows his recognition of this fact by giving to them nearly all his time and attention.

Taste.—Taste plays quite a subordinate part. The healthy baby's obvious eagerness when meal-times arrive suggests that he takes keen pleasure in taste; but probably what really pleases him is the satisfaction of his organic need. Even when he is hungry, his attention can be distracted for a considerable time—at least after the first nine weeks or so—by the superior interest of the visual world; and as early as the third month he may interrupt his meal himself just for the sake of looking about him.

He objects to few tastes. He may, it is true, show a certain caprice about his food, but the evidence seems to show that this depends on other conditions than taste.

He appears to like many tastes that would be unpleasant to an adult. Even in the second year Ruth would suck a lemon undiluted, and Margaret would seek

out the bi-carbonate of soda and eat it with gusto. Most babies seem to enjoy pure salt, and some like peppermint. Olive oil is often taken with avidity, as are various unpleasant medicines.

Smell.—Smell seems in the first year to be in very much the same position as taste. Preyer thought that in the case of his child taste-smell did not differentiate into taste and smell till the second year. The mouth is commonly opened when the fragrance of a flower is perceived.

Early in the third month Margaret, who was accustomed at that time to cry loudly from hunger before her evening meal, would frequently stop crying for a moment or two when her night-dress was put on, in order to attempt to devour its front. This we thought was probably due to the faint smell of milk that was apt to linger on it. About the same time she was greatly interested in a bunch of bright pink carnations. When placed near them she seemed to inhale the perfume; she then opened her mouth, but cried when her nose was put right down to them. Later she again gazed at them with great interest. A day or two after she seemed to inhale and enjoy the scent of mignonette and of a rose.

She has always taken intense pleasure in flowers, but up to the age of three she has never shown preferences that seemed to be dictated by fragrance.

All the available evidence tends to show that odours play quite an unimportant part in the baby's world.

Smell in the human being is capable of very considerable education. Cases are recorded in which the sensitivity of the dog seems to be attained. Also the nervous apparatus of the sense is in an advanced state

at birth. It is then probably simply because sight and touch unify experience so much more satisfactorily that the child devotes all his attention to them and neglects the equally educable sense of smell.

Hearing.—After the first couple of years hearing for a time outstrips sight as a means of mental progress. During the first few months of life, however, Baby may pay little attention to sounds.

Individual differences in reaction towards sound are probably great. Heredity and individual aptitude count for much.

A nervous child is often hypersensitive to sound from a very early age, while quite a normal baby may give no sign of real hearing in the first two months.

Pleasure in musical tone is generally the earliest sign. This may appear at the end of the first month, but more usually occurs in the second.

Association in the case of Hearing.—Association of sounds with visual sensations naturally comes first in connection with the human voice. The sight of mother's face is constantly accompanied by the sound of her voice; Baby fixes his eyes on her face as he listens to the cooing sounds of her voice.

Then when the sound comes first, he begins to turn his eyes to seek her face, thus showing that the association has been made. Gradually the quality of the sound comes to be some indication of the direction in which he must look. He becomes very quick in locating a sound that comes from any point in his visual field. By the fourth month he may delight his mother by turning towards some one who is speaking behind him, or he

may turn right round towards some noise made in the room. Mother quite rightly hails this as a sign of his wonderful intelligence.

Baby's next advance is the discovery that he can make sounds himself. He can do this in two ways, either by the use of his vocal organs, or by means of his hand, as when he shakes his rattle or hammers on the table.

In these cases his interest is not so much in the sound as in the way in which the sound is produced. He is delighted to find he can be a cause. Even before the end of the first year he often tries experiments calculated to throw light on the source and nature of sounds. Axel in the eleventh month was tapping a glass with a spoon when his hand came in contact with the glass and dulled the sound. At once he began intentionally to repeat his actions, taking the greatest interest in the phenomenon produced.

Thus in some cases the tendency of sound seems to be to produce the scientific attitude to the world rather than the sensuous.

The sounds produced by the vocal organs will be considered more conveniently under the head of language.

The World at the End of the First Year.—By the end of the first year Baby has introduced a wonderful amount of order into his world. He can now forecast the future. When he sees, he confidently expects to touch and at times to taste. He is realising that the world is "full of a number of things," all of which are full of deeply interesting possibilities. The spirit of inquiry burns bright within him. His mastery of his

body is increasing every day, and with that his capacity for exploration. He is full of the joy of living. The traditional happiness of kings pales before his happiness.

I once came upon a charming verse written by a little maiden of thirteen. The last two lines were—

> "Babies do not last very long,
> For they turn into boys or girls."

This is true as it is terse. Towards the end of the first year we see the beginning of this change. Baby is no longer just a baby. Through his growing power over the environment he more and more discovers and expresses his own personality.

CHAPTER III

EARLY CONSCIOUSNESS: EXPRESSION

THE child's life is rooted in movement quite as much as in sensation. In some children movement seems the more fundamental of the two. It is possible that from the very beginning individuals fall into the two types which have been distinguished as the motor type and the sensory type.

Motor and Sensory.—In a person of the motor type movement comes first, reflection afterwards. His first need is activity. He finds himself in and through movement. Was it not Oliver Wendell Holmes who said, "I do not talk to express what I think; I talk to find out what I think"?

Miss Shinn says of Ruth with reference to some colour experiments: "A disposition instantly to answer any question, right or wrong, doubtless caused many of her errors, first and last."

Of the two children principally used in this sketch of mental development, Ruth is a motor, Margaret a sensory. Ruth rushes at her answers: it is often difficult to persuade Margaret to answer at all. In the ninth month Ruth made walking movements when held with her feet on the floor. Even in the twelfth month I was unable to get such movements from Margaret. So far as

I could see she scarcely practised the movements until she actually began to walk.

Ruth's motor development is quicker. She walked freely alone in the thirteenth month; Margaret walked alone scarcely at all in the sixteenth month, in the seventeenth she quite suddenly discovered her own power, and was "all over the place on her own feet." It is as if Ruth practises a movement with her body while Margaret practises it in her mind. During her babyhood Margaret always gave one the impression that she knew and felt a great deal more than she could express. She was unwilling to do anything until she felt sure she could. This appeared in learning to speak as well as in learning to walk.

Pre-Volitional Movements.—The child's pre-volitional movements may be classed as Random, Reflex, and Instinctive. Such movements occur before an intended movement is possible. Their importance is great; for the sensory nerve currents which pass upward during the course of the movement help to develop the brain and render sensations of movement possible. Moreover they practise the motor channels, and so prepare the mechanism of the body for the time when command will be taken by the mind.

Random Movements.—Random movements are the irregular non-purposive movements observed chiefly in quite young babies. They occur often in sleep. They include twitching of the limbs, grimaces, rolling of the eyes. They are due to spontaneous overflows of energy from the nerve cells, which are natural enough considering the unstable condition of the nervous system.

Reflex Movements. (See p. 5)—On the very first day such reflexes as swallowing, crying, sneezing, hiccoughing, clasping, starting, may be noted. Parents are frequently impressed by the expert way in which baby yawns before he has been many hours in the world. These movements serve a purpose, but they are not voluntary on the child's part, and they do not require practice.

Instinctive Movements.—These movements are more complex than reflexes. Many of them resemble reflexes in that they are started by some outside stimulus. They resemble reflexes also in that they are purposive, though at first the purpose is not the child's purpose. Racial heredity speaks in these movements.

In the case of the instincts which ripen after the first few months of life the child is quick to adopt the purpose and throws himself forward in it consciously and voluntarily. These instincts show themselves as imperious cravings for certain definite activities, and even with the most good-natured child difficulties are certain to arise if the mother seeks to interfere.

The Chief Instinctive Movements. Grasping.—Grasping has already been referred to in connection with sense development (see p. 23). On the first day a new-born baby will clasp one's finger if laid in his palm. One can hardly call the movement grasping until the thumb is opposed. This occurs about the third month. By the sixth month very considerable skill has been attained. The two hands are used in conjunction, and everything is conveyed to the mouth.

About the ninth month Ruth had almost given up

putting things in her mouth. Margaret still did it frequently in the tenth and eleventh months; but this was obviously often just a bit of fun, for "Not in mouth" had been a command addressed to her repeatedly. A revival of the practice occurred in both children once or twice in the second year.

About the tenth month finger skill becomes marked, and baby shows great delight in picking up crumbs, threads, pins, and other infinitesimal objects from the carpet. In the eleventh month Margaret appreciated highly a piece of string as a toy; she loved to hold it, and laughed with glee when it was drawn away swiftly through her fingers.

In the same month an incident occurred which showed how well her two hands could combine forces. As she sat on the floor a tall, waste-paper basket was placed in front of her. She pulled it towards her, saw the papers at the bottom, and tried to put in her hand. The basket at once righted itself. She then grasped it again, pulled it over, held it in position with one hand, while she fished for the papers with the other. She waved the pieces in the air, and threw them to the side. She continued this occupation happily for about eight minutes, after which time she was interrupted.

Sitting.—Even in the first six weeks some babies manifest a strong preference for the upright position. They like to be held against the shoulder or to be held sitting on one's knee. About the third month baby's upward struggles are often persistent; he lifts his head and shoulders, and often frets because he can do no more. He now sits habitually on mother's knee; but

she supports his back, and has a well-founded distrust of his power of balance.

In the fourth and fifth month baby's favourite play is to take hold of mother's two fingers as he lies on his back, and pull himself into a sitting posture. When taken out in his perambulator he insists on sitting up. Ruth did this as early as the seventeenth week, while Margaret made no effective protest against the usual recumbent position until the ninth month. By the seventh month she would raise herself to a sitting posture from a fairly flat position on the floor if one held down her legs for her, or even one of them.

Before the end of the first year sitting has become a habit for life.

Creeping and Rolling.—Even in the third month, when laid face downward on one's lap, Margaret made strong alternate movements of the legs that suggested creeping. Early in the fourth month she would lie on the floor, slightly supported by cushions, and kick for an hour at a time, making her feet describe circles round one another with tremendous vigour, while at the same time she waved her arms. Later in the month she once rolled from her back on to her side. In the fifth month she made what her mother described as valiant attempts to creep; a fortnight later the report was "not much success at creeping yet, but wriggles round."

In the sixth month a new kind of effort was made. "She lies on her back. Dolly stands just out of reach. She plants her feet firmly on the ground, her head also, and moves the whole body, stretching her arms for Dolly. She can't reach, turns away and cries, and then tries again."

After this there was no noticeable progress till the

ninth month, when the baby took to rolling, and would roll right across the floor of a small room. This movement was not made in order to get things, but just for the love of exercise. There is no record of it in the following month.

In the tenth month she once or twice went backward in an effort to reach things when in a position convenient to creeping. In this month she sat a great deal on the floor, and would reach for things, trying first one hand and then the other. In this way she began to sit along, first in an accidental way, then with vigour and purpose. This mode of locomotion she found so satisfactory that she practically gave up any notion she might have had of creeping.

Right up to the seventeenth month, when walking took its place, this "hitching" was her regular method of progression. By the fourteenth month she had brought it to great perfection. When she saw any desired object —generally a book left by some one on chair or sofa— she would utter a war cry, clear her decks for action, and bear down upon it with tremendous rapidity, sweeping out of her way anything that lay in her path by swift movements of her little hands.

With respect to creeping, Miss Shinn conjectures that "without the hampering influence of long skirts and the practice of keeping babies off the floor, this primitive, quadrupedal movement would appear much earlier, and play a larger part in the infant's activities than it does. If it preceded securely balanced sitting (as my observations indicate that, without any artificial check, it might), the less natural and less useful hitching would never appear as a substitute."

My notes do not tend to confirm this conjecture. We expected Margaret to creep, and we gave her every encouragement; but her attempts were few and unsuccessful. The sitting movement, as she developed it, suited her purposes remarkably well. She kept her object in view the whole time; her hands were free; she could carry things with her if she wished, and in a race with creeping babies I do not think she would have been the last man in.

In the tenth month Ruth crept rapidly and freely on hands and knees. In the eleventh and twelfth months she showed a preference for creeping on hands and feet; but this movement she could not keep up so long. By the thirteenth month creeping was almost abandoned in favour of walking.

Axel could creep in the thirteenth month, and in the fourteenth was getting along nimbly on hands and knees.

Kneeling, Standing, Walking. — Some babies make straight for the adult mode of locomotion. Thus Walter "did not walk early, but never crawled. He began when a year old to try to walk, and would hardly keep off his feet, so we had to put a scarf under his arms to hold him up, and he enjoyed walking so. It was on the 415th day that he walked alone for the first time. Then it was a run, and he only did it when his hands were full, and he could not hold on to anything. He ran right across the room. After that he wasn't afraid to try steps alone, and very soon was quite steady on his legs."

In the eleventh month Margaret seized a favourable opportunity and pulled herself to a standing position by

means of a window bar. Her pride in this achievement was very evident, and she turned round with an obvious demand for sympathy. Her eagerness to repeat the performance was shown again and again.

By the end of the twelfth month she could stand without support for a few seconds, but evidently felt very unsafe. She could pull herself to a kneeling position in her cot, but not till the thirteenth month did she pull herself to a standing position.

In the thirteenth and fourteenth months she would walk a few steps holding to the sofa. She would also walk a little, if both her hands were held. Her steps were very uncertain. In the fifteenth month her walking became much steadier, and she was manifestly very proud of her progress. Not till the beginning of the sixteenth month did she venture a few steps alone. She would go back and forward between two of us arriving with a little run. It was interesting to watch her measuring the distance with her eye before she started. Sometimes she would do this for several seconds and then resolutely decline the venture. An unexpected tumble one day, though she was not hurt, made her reluctant to try again. Till the end of the month she liked at least a finger to hold on to when she walked, but she sometimes needed it very little.

In this month (sixteenth) she discovered she could walk by herself, if she pushed a light chair in front of her, and this exercise delighted her greatly. One day she was allowed to walk pushing her "pram." This became a passion with her. Once when she was crying she was allowed to push the "pram" to console her; when she seemed tired we popped her in, and she voiced

her protests to the world at large for about an hour before she dropped asleep. Another time when we did not interfere by main force, she cried with fatigue before she would allow herself to be put in.

Early in the seventeenth month she suddenly took to independent walking.

Ruth, as one might expect, realised that walking was the thing much earlier, and went through the preliminary stages more quickly. She showed the same pride in the achievement that Margaret did.

In the eighth month she pulled herself to her knees, and before the end of the month she was pulling herself to her feet every day. In the tenth month she made constant efforts to stand alone, and in the eleventh could do so quite steadily. In the tenth month she would step along holding on to the furniture; in the eleventh she would walk if one hand was held; in the twelfth she was persuaded to take a few steps alone; and in the thirteenth she was toddling freely about house and garden.

Climbing.—If it is true, as we are told, that our far distant ancestors spent much of their time among the tree-tops, it might be expected that children should show traces of their racial history in an early tendency to climb.

This tendency does appear. Every mother knows the attraction that the stairs have for baby. Going up is very well. It is coming down that is the trouble, and this baby often finds out for himself. Peggy, when not quite three, climbed up the two steps of a tiny ladder; she then set up a wail, because she found she could not come down again. Yet months before this she was able

to climb nimbly over the foot of a full-sized iron bedstead.

Margaret was not a climbing child. Ruth was. During the first two years Margaret made very few attempts to climb on sofa, chair, or table. At the end of the fifteenth month she made a feeble attempt to get on the sofa; she leant on the seat, and raised one foot to the edge. Her half-hearted essays were in strong contrast to Ruth's eagerness and energy. From the tenth month onward Ruth felt the call of the heights, and she practised assiduously on every possible occasion, attaining a considerable degree of skill.

Running.—Some children run or rather trot before they walk, the swifter motion conducing to the preservation of balance. Apart from this, running develops quite naturally out of eager walking.

In the fifteenth month Ruth almost abandoned walking for the trotting gait. In the seventeenth and eighteenth months she ran about untiringly. Tripping was frequent, but falls were taken with great equanimity. About the middle of the third year tripping practically ceased.

Running was associated, as mentioned above, with Margaret's early walking. Indeed her early gait might be described as a trot rather than a walk. In the twentieth month she ran, poking her head forward. In the twenty-fourth month she did fast running, and it was a pretty sight to see her fat legs twinkling across the grass as she brought dandelion head after dandelion head to her mother.

Dancing and Jumping.—Exuberance of spirits

finds outlet in varied movements. Dancing is the best term for some of these. In the twenty-seventh month if we said to Margaret, "Dance, Baby," she would rise on her toes and skip lightly about.

Jumping is probably an imitative movement, though babies often make springing movements with their trunk muscles before locomotion has begun at all.

In the twenty-seventh month Margaret would make great efforts to jump when asked; but scarcely succeeded in raising herself from the ground. She loved the combination of jumping and swinging that a child may experience when two adults take her hands. This exercise probably helped her to come lightly away from the ground. In the following summer, the beginning of her fourth year, she could jump quite a respectable distance—about twelve inches.

About her twenty-first month Ruth made a definite attempt to imitate an older boy jumping. She made the body movements, but did not succeed in raising the feet. Two months later she managed this, and practised assiduously for ten days or so.

Attitude of the Educator.—During the period when the child's attention is directed to practising and perfecting the instinctive movements of the race, the part of the educator is to give him as much freedom as possible, to guard against serious accidents (as in climbing), and to correct defects. For, as Miss Shinn has shown, even in a healthy child the best mode of movement is not necessarily the one developed.

No pressure should be put on the child to walk, or to perform any other active exercise before he shows the inclination to do so.

Sometimes, as in Walter's case in walking, the inclination may be strongly present before the ability is there.

In such cases artificial aids, such as belts or reins by which the child is held upright, are often given. These should be used with caution, as the pressure on the little chest which may result is very undesirable.

Especially in the case of a child suffering from rickets walking should not be encouraged, as the weight of the body may bend the bones of the legs, and give rise to permanent deformity.

On the whole it is best to let the child struggle to attain the motor activities of his race at his own time and at his own rate.

The educator may be useful in suggesting varieties of movement to the child which will help him to gain control over his body. Walking on tiptoe, walking backwards, walking on a narrow edge or a height, standing on one foot—these and other similar exercises will appeal to the child some time in his third and fourth years; and when he is ready for them he will practise them with delight. Large movements of the trunk and limbs should be chosen.

Expressive Movements. — Associated with the emotional side of our nature are certain movements which in many respects are best classed as instinctive. At a very early age pleasure or satisfaction finds expression in a smile; pain or discomfort in a cry.

Crying occurs generally at birth with the first inspiration. The first smile commonly appears in the second month, while the more extreme expression of pleasure—laughter—may appear in the third mouth.

Stamping the feet, clapping the hands, jumping and dancing about are ways in which little children quite spontaneously express their joy.

Among emotions properly so-called MacDougall has distinguished seven which he regards as instinctive. These are fear, anger, tender emotion, positive and negative self-feeling, disgust, and wonder. These all find expression very early in characteristic movements.

Fear.—Fear often shows itself unmistakably before the child is a year old. Baby cries, shrinks away from the feared object, turns to his mother for protection.

According to a study published by Stanley Hall in 1897, very common early fears are fears of water, wind, darkness, thunder and lightning, animals, fur, big eyes and big teeth; a little later appear dream-fears, fear of ghosts, of being alone. He suggests that these fears are really relics of our racial history. "We have two hundred and twenty-three cases," he says, "which shew that children during their first year of life have an instinctive fear of fur. It is not because they see it, but because they touch it. It is touched, and there is some apparatus there which causes convulsions in a child who touches the fur. Another common cause of fear is big eyes; making big eyes at children frightens them. Why should a child be afraid of big eyes, of an owl, for instance? Another terror to a young child is a great display of teeth. If the teeth are false, and show a slight motion, the fear is very manifest. How can we explain such things? . . . I am persuaded after a careful study of this, that here we have some of the oldest things in the human soul that take us away back, so that we call those fears rudimentary organs. . . . These

fears are traces of a long struggle which we know the human race went through with animals with big teeth, big eyes, and fur, that were sometimes threatening to exterminate the human race."

It may be so. It is an attractive theory. Yet undoubtedly many children are quite devoid of the special fears which are best explained in this way.

The primitive source of fear seems to be sound. A startling sound may produce signs of fear in the first few weeks of life. In a thunderstorm it is the noises rather than the flashes which terrify children. A strange voice is often more alarming than a strange face. I have read somewhere of a baby in a burning house who was found by the firemen lying in its cradle smiling at the flames; as soon as it was outside it screamed with fear at the tumultuous noise.

Fear of the strange, the unusual, the mysterious, develops just as soon as the child has some sense of what is to be expected. This fear marches just ahead of our knowledge. The most hardened sceptic may feel fear in the presence of ghostly phenomena which he utterly fails to explain. This fear is an important constituent in the complex emotions of awe and reverence.

The child's circle of knowledge is small, hence fear may spring upon him from many directions; and many of these fears seem very irrational to us.

A boy of ten months screamed with fear when he was first presented with a squeaking toy.

"A little girl was so afraid of doves in the seventeenth week and in the eleventh month that she could not make up her mind to stroke them; in the thirteenth month

she ventured to stroke a dove, but immediately drew back her hand; in the fourteenth month her fear was overcome." (Preyer.)

In her fifteenth month we one morning heard Margaret uttering inarticulate exclamations of distress, and saw that she was pointing to something and backing away from it; on looking we discovered a thistledown on the floor.

Sully gives a parallel instance.

"A little girl of three, standing by the bedside of her mother (who was ill at the time), was so frightened at the sight of a feather, which she accidentally pulled out of the eiderdown quilt, floating in the air, that she would not approach the bed for days afterwards."

Another illustration given by Sully is worth quoting to show the unexpected direction which children's fears may take. They fear when we do not foresee it, and have no fear when we expect it.

A little girl about four years old was one day found by her mother "standing, the eyes wide open and filled with tears, the arms outstretched for help, evidently transfixed with terror, while a small wood-louse made its slow way towards her. The next day the child was taken for the first time to the 'Zoo,' and the mother, anticipating trouble, held the child's hand. But there was no need. A 'fearless spirit' in general, she released her hand at the first sight of the elephant, and galloped after the monster."

Children's fears, however absurd they appear to us, should be treated with sympathy and respect. We must realise that while the emotion lasts the child is in the grip of a force that he does not himself understand, and

that he is powerless to control all in a moment. If he is allowed gradually to become accustomed to the object of his fear, if he sees other people touching it with pleasure, as in the case of the fear of doves, other tendencies within him, such as imitation, will in time exterminate the fear.

As far as possible the fear condition should not be allowed to arise. Fear begets fear, and a habit of feeling fear is a bad habit.

Anger.—Anger appears early. Darwin noticed its symptoms in one of his own children at less than four months. It commonly arises in connection with a thwarted impulse. Margaret, though naturally a sunny and even-tempered person, would at times before her meals in this world were adjusted to her satisfaction, break into raging cries, snarling, throwing her limbs about, gnawing at her own hands. A baby will dash aside a favourite toy if offered him when he passionately desires something else. "Young children, when in a violent rage, roll on the ground on their backs or bellies screaming, kicking, scratching, or biting everything within reach." (Darwin.)

As with fear, so with anger. We should try not to let it arise often during the early years, so as to avoid the danger of its becoming a habit.

This does not of course mean that we should give a child all his own way. But it does mean that we should arrange for his early instincts to have scope. Otherwise bottled-up energy is apt to find an outlet in anger.

Tender Emotion.—Tender emotion is the emotional state which manifests itself in the impulse to approach, fondle, caress, protect. It appears as a component part

of the maternal instinct. It is perhaps the most important of the impulses leading to consideration for others.

In some children it appears very early in a rudimentary form. A monthly nurse will tell you that some babies are much more "loving" than others. Licking and biting are common spontaneous expressions of this emotion: out of these probably kissing develops.

My first record of this affectionate licking in Margaret's case belongs to the eleventh month, but the act may have occurred sooner. In the fifteenth month she would frequently stop even in the middle of her bottle to touch her mother's face with her mouth. At other times she would do this spontaneously to certain favoured individuals.

Ruth would lick one's cheek in the second month if held against it. This was probably just due to touch hunger, the tongue being still the part most able to satisfy this need. Later as she became able to discriminate this licking became a mark of favour.

The child's early expressions of this emotion should be received in a like spirit. Generally speaking, baby's caresses are regarded as valued distinctions, and are not likely to be snubbed.

There is perhaps more danger of our asking from him expressions of affection at times when he does not feel the emotion, and we may thus begin to create that divergence between feeling and expression which is too common in our present-day society.

Positive and Negative Self-Feeling.—It is very difficult to trace the emergence of these feelings. When one is in intimate touch with an infant from its beginning, there comes a time when one seems to perceive

that Baby is becoming a little person. He is feeling after independence. He is beginning to realise and to assert his own individuality. This change is indicated by certain acts which seem to be prompted by the self-feelings.

In her twelfth month Margaret would call attention to herself by little squeals directed towards the other people in the room. In the fifteenth month such ejaculations were most often aimed at her grandfather who was quietly reading. When she had succeeded in making him look up, she would pretend to be very busy with something else.

May this conduct not have been due to the beginnings of self-assertion quickly followed by self-subjection?

Self-elation was unmistakably manifested by both Ruth and Margaret in connection with the acquisition of the power to stand.

When a fall produces self-consciousness, as it does at times in the second year, this is probably due to the check it administers to the self-assertive impulse. Margaret liked this check so little that once in the nineteenth month when she tripped accidentally over a rug, she remained down as if she had fallen purposely. In the twenty-sixth month she was biting the table-cloth one day; her uncle said, "Naughty baby"; she immediately flushed, looked greatly distressed, and went to her mother saying, "Ba' baby, baby ba'."

In connection with such emotional experiences there develops a more permanent and stable attitude to the self, which is known as the Self-Sentiment. This becomes the central core of personality.

It seems generally agreed that the use of the first

personal pronoun marks a decided step in the growth of the consciousness of self. At first Baby speaks of himself in the third person, making use of the name by which other people call him. About the beginning of the third year he leaves off this custom and begins to say "I" and "me."

Possibly the use of the first personal pronoun does mark the recognition of the self. Yet I have no doubt that the self-sentiment has been present for months before this.

Negative self-feeling is not to be confounded with the feeling we experience when our positive self-feeling is thwarted. That is always a painful experience. Negative self-feeling is pleasant to many natures. It is an element in all hero-worship. No one capable of genuine admiration is without some degree of pleasure in the negative self-feeling which prompts such self-subjection.

From the nature of things the child must often experience negative self-feeling. He is so small, so ignorant, so dependent; the big people around him are so strong, and have such wonderful stores of knowledge.

The negative self-feeling of the child often comes out in a very charming way in his gratitude for the little services rendered him. Before he can speak he will often be inordinately "loving" at such times, nuzzling his face into your hand, or throwing his little arms round your neck. (Cf. p. 126)

Disgust.—Disgust shows itself by the rejection of certain substances from the mouth, and also in a characteristic shrinking and expression of aversion, when anything slippery or slimy comes in contact with the skin.

Darwin says, "I never saw disgust more plainly

expressed than on the face of one of my infants at the age of five months, when, for the first time, some cold water, and again a month afterwards, when a piece of ripe cherry was put into his mouth. This was shown by the lips and whole mouth assuming a shape which allowed the contents to run or fall quickly out; the tongue being likewise protruded." Darwin, however, doubts whether the child experienced real disgust; the eyes and forehead expressed much surprise and consideration.

James gave a live frog to one of his own children when a few months old, and again when he was a year and a half. "The first time he seized it promptly, and holding it, in spite of its struggling, at last got its head into his mouth. He then let it crawl up his breast, and get upon his face, without showing alarm. But the second time, although he had seen no frog and heard no story about a frog between whiles, it was almost impossible to induce him to touch it."

In older children and in adults disgust is easily roused by the imagination. Some readers may recognise disgust in themselves when they read the first part of the above story.

Wonder and Curiosity.—This is the fundamental instinct in the scientific spirit. It is often of value in counterbalancing fear, as its impulse is to approach and examine. It appears early in many children in the form of definite experimentation.

A traveller gives the following account of a Kaffir baby. He saw it accidentally touch an iron pot which was hot. Reflexly the hand was withdrawn and baby's attention was caught by something else. Again it

touched by accident. "The child evidently did not grasp the fact that the painful sensation was caused by the contact of the finger with the hot iron; but to judge from the expression of the face, a dim suspicion that this might possibly account for the sensation dawned on the child, for after a few moments of meditating, the baby, evidently with the idea of inquiry, put out its first finger and deliberately touched the pot. Having done this it as deliberately withdrew its hand and looked at the finger with surprise; it then looked at the pot and seemed puzzled. . . . No sooner had the child recovered from this expression of surprise than it deliberately put out its finger once more and pressed it firmly against the lid of the pot. A short period elapsed in which nerve currents were travelling to the brain and were being sorted out in that very dull quarter, and then the baby set up a piteous howl and was promptly seized by its mother, who removed it from the danger zone."

So early does science claim her victims. In my opinion the traveller does less than justice to the baby's courage and intelligence.

Curiosity in children used to be regarded as a vice, and such tales as "Meddlesome Matty" were invented with the aim of effecting a cure.

In too many households children's questions and persistent endeavours to find out about things are still regarded as a nuisance and subjected to considerable repression.

This repression is of course a mistake and must interfere with the child's mental growth.

On the other hand, it is equally harmful to answer

the child's questions too fully. The amount of information given must always be determined by the child's attitude. Too much food is as bad as too little.

Complex Emotions.—Through the mingling of these simple emotions complex emotional processes arise; for example, gratitude, awe, reverence.

Sentiments.—As the child's memory develops, emotional tendencies become associated with definite persons and objects. The idea of each of these persons and objects becomes a nucleus round which cluster associated ideas and emotional and active tendencies. These mental complexes exist for the most part below the level of consciousness; yet they play an active part in determining the contents of consciousness. They are now generally termed Sentiments. It should be observed this is a modification of the ordinary use of that term.

As the child grows, very important complexes are built up round the mother, the father, the self, and these come to determine a large part of his activity.

A little maid was once offered a pretty blue sash. She drew back and said, "My mother would give me sashes herself, if she thought I ought to have sashes." The sentiment she had built up round her mother was touched, and only when she was satisfied that no slight was intended to her, could she react naturally to the sash.

The bodies of knowledge that a child acquires might also fairly be called complexes or sentiments. We may say he has a geography, a history, a number sentiment. Emotional tendencies are intertwined with these senti-

ments more than we are apt to suppose. How many children devote themselves with ardour to a particular subject simply because of a sentiment of affection for a particular teacher!

These sentiments tend to have a considerable amount of independence of one another, and some systems of education tend to promote this independence.

We all know the story of the inspector who, when taking a class in scripture, inquired, "Where is Athens?" Nobody seemed to know. "This is geography," he remarked. Every hand went up.

This independence of the sentiments may lead to inconsistencies of character. Thus a man may have incorporated his idea of justice in the sentiment that he has towards his employees, yet may have failed to incorporate it in that which he has to his wife.

There are certain moral sentiments or ideals which ought to be sensitive in connection with all the others, and it is when this is the case that we have the perfect character.

CHAPTER IV

SOME FUNDAMENTAL CONCEPTS

In this chapter a few fundamental concepts will be considered which very early come to play an important part in Baby's world.

Form.—Baby begins to distinguish form before he begins to distinguish colour. It is true that light colours soon appear to attract him, but this is in virtue of their brightness, not in virtue of their colour. When he begins to recognise objects he does so by their form assisted by their light and shade.

In this connection his attitude towards pictures is of the greatest interest.

In the fourth month Ruth liked to be held up to see the pictures on the wall. In Margaret this liking was first noted in the sixth month, but her attitude to the mirror indicates that it might have developed sooner had opportunity been given.

Miss Shinn considers that Ruth understood the purport of pictures quite well by the time she was eleven months.

In the twelfth month she would, when asked, point out cats, dogs, and flowers in all pictures.

In the fifteenth month she recognised her father's face in a group with eight others.

In the fifteenth month, "seeing a picture of the 'three little kittens' seated at dinner, she began to smack her lips, pointing to the table." This shows a high level of intelligence, because it seems to indicate a certain grasp of the picture as a whole. A little later certain names learned from pictures were readily applied to the real things.

The nineteenth and twentieth months were times of eager picture study. The special interest at this time was bird pictures; animals and children were also favourites.

Sully shows himself very sceptical as to the young child's grasp of pictures as representations. He bases his doubts on the admitted fact that children up to four years of age and later will at times treat pictures as realities; as in the case of the little boy who was much aggrieved because his grandfather could not tell him where a pictured train was going.

I agree with Miss Shinn in regarding such behaviour as due to the play impulse of the child. A child gets extraordinary satisfaction out of pretending the pictured objects are real, but he knows they are not just as well as we know that the villain on the stage is not really killed. Yet neither the child nor the adult thanks the person who is continually tearing aside the veil of illusion which has been voluntarily drawn across reality.

At the beginning of the eleventh month Margaret was much interested in a coloured picture book. She kept rubbing her hands over the pictures and then shutting the book and examining the covers. Her actions suggested that she was trying to find out if the pictured objects did not really have another side. At this time I

believe she satisfied herself as to the real nature of pictures.

In the fourteenth month she would pretend to gather pictured flowers and smell them. This was certainly dramatic play.

In the fifteenth month it happened that I showed her a flower catalogue in which were many brightly-coloured pictures. She was extraordinarily eager and interested, and cried hard when the book was put away. There were many counter-attractions at this time, as we were in the country, yet for fully a fortnight this and some other simple picture books were the master passion. The child would come and beg to be shown them, and would look at page after page over and over again, rarely allowing herself to be set down from my knee without violent protest.

She often liked me to analyse the pictures by pointing to the different parts and saying the names. If I did not do this she sometimes took my hand and placed it on the pictures, manifesting dissatisfaction till I began to give her a lesson. But I could rarely induce her to take her turn and point to any object I named. So it was difficult to be sure how far she recognised the representations. This reluctance, however, was a mere example of her general dislike to committing herself before she was absolutely sure.

In the eighteenth month Margaret pointed out her father in a group photograph of about a dozen people. Very likely she could have done this sooner. But, of course such a recognition means more than the general recognition of cats, dogs, etc.

The recognition of pictures seems to proceed in

exactly the same way as the recognition of objects. Just the most salient characteristics are noted at first. Ruth said "moo" at a picture of a camel in the fifteenth month. Then when the need of distinguishing arises, differences are noted sufficient for the purpose. This need often arises by means of the adult's correction of the mistake made by the child, a different name being given to the object which has been wrongly classed. This difference of name spurs the child on to look for differences in the things.

Pictures as an Instrument of Education.—It is easy to see what a powerful educational instrument we have in this intense interest in pictured form, which seems to belong to the beginning of the second year. At this period the child really learns forms more easily than he does later, when his attention is distracted by divers other interests.

The plane forms should be presented to the child at this time, and should be named to him correctly—circle, ellipse, square, etc. Also, if my experience is typical, the letters of the alphabet will be now learned with great ease and interest. Margaret knew O and S in the sixteenth month, and though her teaching was extremely spasmodic and haphazard, for we were not anxious for her to bury herself in a book too early, she knew most of the letters early in her third year. In the fourth she had to some extent forgotten them. A delightful wooden alphabet was given her in her fourth year; but she showed no great interest in it. The question arises whether it would not have been more appreciated in the second year.

It is a common thing for children at this period to

learn the names of most of the well-known animals from picture blocks or books. This knowledge is easily applied to the real animals, and when a visit to the "Zoo" comes, the elephant and hippopotamus are greeted as old friends.

Superiority of Pictures to Reality as Learning Material.—In some respects pictures are superior to reality as learning material. It is easy to see that pictures tend to throw into relief, to emphasise characteristic differences; whereas in dealing with reality it sometimes takes us a long time to fix on the important differences. Moreover, the child can study his pictures at any moment and for as long as he likes. Thirdly, clear pictures can be made of creatures, *e.g.* birds, which it is very difficult to see properly in the natural state.

Nature of the Material.—Elaborate pictures are not required. Clear pictures in black and white are probably best at first. Coloured pictures should be added, and are indeed necessary when differences of colour, as in certain species of birds, are more striking than differences of form.

Sets of cards, each card bearing one such picture of animal, bird, tree, flower, etc., would form valuable instruction material, and would lay a sound foundation for many of the sciences.

Schools for Babies.—Many tender-hearted people will hold up their hands in horror at the idea of instruction for babies under two. Let the poor little things alone, they will say, school time will come soon enough.

It is not, of course, intended that the instruction

material should be pressed upon the child, that he should be given set lessons, or forced to attend to certain things at certain times.

No. In this school it is Baby who is the master. It is he who says imperiously, "Come and teach me this—at once—this very minute." It is he who dismisses the class when he feels he must be about other business. It is the wearied teacher who sometimes begs off when she has gone over the same pictures five hundred and fifty-five times.

Nor do his views as to his course of study always coincide with those of his teacher.

About the time when Margaret took her first arduous course of picture study I had presented her with a set of Montessori cylinders. An intelligent and well-disposed baby would, I thought, spend much time examining these delightful things and fitting them into their proper holes. Pictures, I considered, belonged to a later stage of development.

Such was not Margaret's opinion.

She accepted the cylinders with eager interest, and I am sure she learned a good deal from them. But she very seldom demanded them spontaneously, nor did she ever use them long at one time. I found the best way to induce her to manipulate them was to sit on the floor myself and begin to pull out the cylinders, paying no attention to the child. Then she would bear down upon me, and for a few minutes good-naturedly assist in my education.

It was very different with the pictures. As soon as she knew about them she not only demanded them, but insisted upon having them.

But of course she could not have known that she required pictures, if she had never seen any.

Here comes in the function of the teacher. She must see that any material that Baby may require is available for him. She must also consider the material in the light of his future, and see that from this point of view it is the best obtainable.

Colour.—It is very difficult to find out when the child first begins to be sensitive to colour differences. Mothers frequently say that babies showed joy in brightly coloured curtains or ribbons or tassels at the age of a few weeks. But it is hard to satisfy the scientific investigator that the joy was due to the colour and not to some other quality in the object.

It is certain that while little children who are just learning to speak affix names to objects with surprising ease, they are very slow in coming to use colour names correctly. And this is the case even where ample opportunity is given for learning.

When we name a colour to a child he has to fix his attention on the quality as distinguished from the object, if he is to understand us. But I cannot think this abstraction would be difficult for him if the colour quality were as prominent in his experience as it is in ours. The similar abstraction required for number, so far, at least, as is involved in the distinction between "one" and "more than one" is made with surprising readiness. This discrepancy would be accounted for, if colour sensations in the child are much more alike than they are in us.

In Margaret's case we could see no conclusive evidence of interest in or preferences among colours before

the twenty-third month. Then she appeared to select by preference a red book among the books on the shelf. She seemed to be feeling after colour at this time, for early in the month she brought me a piece of blue stuff and said "Boo," but soon after applied the same term to her white dress. In the twenty-fourth month she seemed to me to know both blue and red, but even at the end of the month her mother was not sure that she knew red.

In the twenty-seventh month she called all the green letters "neen" in an alphabet in which the letters were coloured blue, red, and green. In the same month she pointed out quite correctly white and yellow flowers in a picture book, but she would not attempt to say the word yellow. At the same time she picked up the word "mink" (pink) from me, and applied it correctly several times.

About this time the child showed that she had some colour memory, for not having seen me for about three weeks, she recalled that I had then been wearing a jacket with red buttons.

At the kindergarten schools children between three and five often show extraordinary ineptitude in arranging the Montessori colour tablets. They confuse not only shades, but such distinctive colours as red and blue. Indeed, these children often seemed to me to have less difficulty with the shades than with the colours. This indeed is quite what one would expect if the colour sense develops rather slowly in these cases, and in all cases long after perception of light and shade.

Generally speaking, yellow and red are recognised and correctly named considerably sooner than are green.

and blue. Thus at a time when Axel was right in 96·7 and 86·7 per cent. of his judgments of yellow and red respectively, he was right in only 45·0 and 28·8 per cent. of his judgments of green and blue.[1]

The record of Ruth, though much fuller, agrees pretty well with that of Margaret so far as the order of knowing the colours is concerned. She appeared to know red in the sixteenth month, and in the eighteenth she seemed also to know blue and yellow. Yet later in the same month there were instances of hopeless confusion among those colours. About this time, however, Ruth began to take immense interest in colours, and to beg for instruction and exercises. As a result of this she was able to distinguish and name all the colours of the spectrum before she was twenty-two months old.

Such a period of interest in colour did not develop in Margaret, possibly because suitable material did not happen to be supplied at the right time.

It seems clear that it is towards the end of the second year that we ought to be prepared to introduce such material into baby's school.

Of course by means of coloured pictures and also by frequent opportunities of looking at flowers, trees, and other natural objects, he should long before this have the possibility of colour experience; for even in the first year he is probably capable of faint colour sensations, particularly in the case of the warm colours.

Number.—How does the number concept develop in the child?

A child is engrossed in the study of the qualities of

[1] Preyer, "The Senses and the Will," p. 19.

objects; shape, size, weight, resistance appeal to him directly. But when we think of things from the point of view of number, we abstract from all those more insistent and arresting qualities. How does the child come to take this step, and withdraw his thoughts from the differences between two groups of things—differences so innumerable, so striking—and fix them upon a likeness so elusive as that of number? Between three balls and three chairs how is resemblance perceived?

Early Number Teaching. Counting.—The child that is fortunate enough to have the right kind of mother or nurse gets his first number teaching from her. She plays with his fingers and toes, taking them one after the other in order. As she touches each she says a line of one of the old-established rhymes, "This little pig went to market," or "This is the man that broke the barn." Thus the notion of an ordered series begins to be formed in Baby's mind.

Then in various ways Mother counts over the little fingers and toes, using the number words, One, Two, Three, &c. She claps her own hands or baby's hands and counts. As he grows older she counts the steps as he climbs. He begins to count with her, and he can soon say the first nine or ten number names in order.

He cannot really count yet, however, for he pays little or no attention to the fact that there is an exact one-to-one correspondence between the objects counted and the number words. When the child attempts to count by himself he does not observe this correspondence. He does not fit each number name to an object. He may begin his counting too soon, or he may say two or more number names without setting aside the

objects that correspond. Even after the notion of number is considerably developed, he often shows failure to grasp the exact nature of the counting process. Binet finds that while nearly all children can count four things correctly at five years of age, they do not count thirteen things accurately until they are six.

The first notion of number may be that of position in a series rather than of total number in a group. If we are counting things to a little child he may startle us by the senseless query, "Which is three?" In such a case he may think that three is the name of the particular object pointed to, or he may think that three means a definite place in a series; that is, his notion of number may be ordinal rather than cardinal.

Any tendency to think that the number words are names of particular things is soon checked by their application to very many different objects. But it may take longer before the child realises that each number word stands for the whole group of objects already counted, and does not apply only to that last reckoned.

In some cases small groups up to three or four are recognised before the child is really able to count, and with these groups little arithmetical operations are often spontaneously performed.

Thus Walter (28 months) was promised three sweeties. When the time came, he was given two. He at once looked up and said, "More vone, pease."

Margaret (26 months) was one morning holding three hairpins for me. She spontaneously remarked "Two," then corrected herself and said, "Lee." When I took one away she promptly said, "Two." When I took another, she said, "Non" (One).

Preyer refers to a child who at ten months knew at once if one of his nine-pins had been taken away, and who at eighteen months would at once miss any one of his ten animals. This case, however, seems to be quite abnormal, Axel, Preyer's own boy, although he could say over the first five numerals, could not apply even "two" correctly, in the twenty-ninth month.

The fact that small groups are by many children early recognised as wholes may partly explain why children can count four things a year before they can count thirteen things. The little subjects often see that there are four things before they begin to count at all.

All concepts in a little child's mind are extremely vague and fluid. No clear-cut meanings are present at all. At the least hint of criticism a child will slide from his tentative interpretation and take up another standpoint which he is just as ready to abandon.

It is this fluidity that makes it so extraordinarily difficult to discover what is the content of the child's mind at any given time. By a thousand arts he eludes direct questions. Self-contradiction is nothing to him. He experiments first in one direction, then in another; only after flitting hither and thither for an indefinite time does he at last feel himself committed to any settled belief.

The concept of number is no exception to the rule.

The point is well brought out in some experiments I tried with Margaret in the thirty-ninth month. As far as definite knowledge went she showed herself less certain than she had appeared to be more than a year earlier. She was, however, dealing with larger numbers.

At this time she was fond of wrapping up bricks in

paper and bringing the parcel to us, announcing at the same time what the bricks represented.

I asked for five roses. She went to her bricks, and inquired, "Is three five?" "No." She then brought four. "That is only four; I wanted five." "But four *is* a lot. You can have that lot."

I tried again to get five or six. "I could let you have 1, 2, 3, 4, 5, 6 horses." I accepted, and was then told, "I could let you have five." "But you were to give me six." "I have changed my mind." She then brought three, and asked, "Is that five?" "That is three." "I will get one more."

At this time, when the material used was playing cards, the child would name one, two, three, and four spots correctly at a glance.

Three days later I tried again to get five. She brought me six twice, asking, "Is this five?" She then declined to get me exactly five, but having made me count over to her all the material (12 hips) told me I could have twelve. I begged for five. The following evasions give indications of her state of mind. "Five there'll be if I get more than five." "You can have twelve, and you can have eleven too." "You can have twelve; I have not got any five, you know."

Even in the forty-fourth month Margaret's notion of counting was still far removed from ours. She liked occasionally to be allowed to name the number of spots on playing cards, as she had seen me give several number lessons to an older child by their means. In a test at this time she named the cards correctly up to four; the higher numbers she at first counted inaccurately pointing with her finger; soon she gave up

pointing, just glanced at the card and counted aloud quickly up to nine or ten; she then inquired if it wasn't clever to do it without pointing.

In the forty-seventh month her counting was becoming decidedly more accurate. One morning we were playing with plasticene, and we made balls for her family's breakfast, "I have fifteen family," she said. So I made balls, and she put them in the frying-pan. Each time I asked her, "How many have you now?" and each time she counted them over from the beginning. The simple idea of one more did not occur to her.

At this time the notion of number as expressing magnitude seemed to be developing in the little mind. One morning before breakfast we were wondering when Mother would appear. Margaret asserted with great emphasis, "She *will* come some time." I told her she had faith if she believed she would come. "Yes," she returned. "I have more faith than you. I have fourteen faith."

Again, when she was comparing her short arm with mine, she said, "My arm is only 1, 2, 3, 4; yours is 1, 2, 3, 4, 5, 6."

In this month (47th) Margaret would often name six spots correctly when we used the cards, recognising the six as two threes.

It should be said that at this time no attempt was being made to give the child instruction in Arithmetic. Even her mistakes were not corrected. I wished to see the lines on which her Arithmetical concepts would develop, but I did not wish to hurry development in the least.

It should perhaps also be added that her ancestry on

both sides gives promise that she will later take kindly to all branches of Mathematics.

The experiments, that were tried, often arose from the child's own wish, or at all events in the ordinary course of her play or other occupations.

Early in her fifth year she went for a short time to a Kindergarten class. Here she seems to have learned with certainty the number names in order up to twelve. Before this she had somehow picked up some of the higher number names, *e.g.* forty, fifty, a hundred.

In her fiftieth month I had some further opportunities of testing her number sense.

It happened that she sometimes was given five strawberries at breakfast-time. One morning I gave her one. Having eaten it, she demanded her five. "How many more must I give you to make five?" I said. "Two," she replied, and was quite satisfied when she received this number.

The next morning I started her with two, but when I asked how many more she required to make up her five, I was again told "Two." The opportunities thus offered for teaching were tempting, but in the interests of psychology I resisted temptation.

In a card test done at this time Margaret as before readily named up to six spots at a glance. The others she had to count.

On one occasion, after she had counted correctly one seven, I happened to turn up another immediately afterwards, and she said, "Same amount." I was not aware she knew this word. Her counting of the spots was generally correct, but once she made a ten into eleven by deliberately saying *four, five* to one spot.

When one asked, "What is one more than six?" or any other number, the child had to count from the beginning before she could answer.

I have not been able to find very many observations bearing on the growth of the number concept, so I have given my own with some detail. It is particularly instructive to mark the chaos of the child's early mentality in the region of Mathematics where exact and clear-cut concepts seem a fundamental necessity. The child's tentative essays with number suggest that even here we owe more to experience than in later life we altogether realise.

Individual Differences in the Development of the Number Concept.—Most of us know that there is a point in Mathematics beyond which we cannot go. It has been said that in the very highest region of the Higher Mathematics there are perhaps not more than ten men in the world who can understand one another. Corresponding to this difference of developmental power in the higher levels we find even in our "infant" classes children with a "turn" for figures and children with no such "turn."

One of the latter type was introduced to my notice some two years ago by a teacher in one of our Public Schools. Little Mary was then eight and a half, but had not succeeded in getting out of the baby class because she could make nothing of Arithmetic. In other subjects she was quite satisfactory.

When I first examined her she was about a year behind her age in general intelligence. This I thought might easily be accounted for by her being kept back in

her studies, and so associating with children younger than herself.

Her sense of number was most rudimentary. With respect to the recognition of groups she seemed at about the same stage as Margaret when in her fourth year. When tested with playing cards, she usually named the first four correctly, but none above that. Sometimes she would call a five four. She could not tell how many more six was than five even with the six card before her. When asked to add any two numbers, she gave replies which were hopelessly wide of the mark. She counted things with a fair amount of accuracy.

The chaotic state of her number concepts is shown by the following conversation. I asked how far was the furthest she had ever walked. "To Colinton." "Did you walk back again?" "Yes." "Well, suppose it is three miles there, how far would it be to walk back again?" After deep thought she at last gave me, "Three." "Then how far would it be there and back?" "Thirty-three."

Mary received individual instruction for some time, and by various devices was helped to form the number associations necessary for addition. She was promoted in school, and seems now to be assimilating the multiplication tables with no special difficulty.

The Part of the Educator.—Children come to school at five, but with respect to the number concept they are not even then all at the same stage. The children who have received instruction as they needed it from the beginning, probably know several of the number names, can count fairly well, and can recognise small number groups. Those who have not received

instruction, or who are slow in forming a number concept, may know nothing except a few of the number names.

During the first year of school life we should aim at bringing all the children to the level of the more advanced. It will do the latter no harm to spend this year consolidating their number notions.

Counting should be practised by all. Recognition of number groups should be practised by all. Number games should be frequently played. Cards and dominoes are useful. Counters should be used—the children themselves, old matches, beans, peas will serve as material. The processes of addition, subtraction, multiplication, and division should all be employed as occasion arises. Provision should be made for individual work, for some children have much more natural facility than others, and it is very bad for a child to be kept back when he wants to get on.

It is well that the material provided for working with should be varied, but some at least should be chosen with a view to subsequent instruction in weights and measures. Thus a hundred centimetre cubes, and, if we are going to cling to our present system of measurement, a hundred and forty-four inch cubes, would form two useful sets of counters. Scales and weights and a set of liquid measures should be part of the equipment of the schoolroom; and the children should be encouraged to make themselves practically acquainted with these things. At the ages of five or six it would be a great joy to find out how exactly two pints *always* fills up a quart measure, and how 16 oz. or two half-pound weights *always* balance a pound.

At this stage it is of no great importance whether the number symbols are taught or not. Probably the notion of place value involved in the symbol 10 will be more easily assimilated in the second or third school year.

Sense of Time and Space.—Time and Space are among the fundamental problems of philosophy; and the child early begins to feel the mystery at least of the former.

It is easy to see how our apparently contradictory use of time words challenges the developing intelligence.

An early stage is represented by the following conversation.

M. (34th month). "Are we going home now?" "No, by and by." Some time elapses, during which her adult companions forget what has passed. "Are we going home now?" "Yes." "Is it by and by?" "No, it's now." "I *thought* we were going home by and by."

In the fortieth month Margaret inquired, "Why isn't yesterday to-day when we're in it?" and on the following day she stated her conclusions thus: "Now the other day is gone, it is yesterday. When to-day is gone, then it'll be yesterday."

How far such statements imply that the child thinks the days which are past have a concrete existence is a moot point. Sully inclines to the view that such questions as, "Where is yesterday gone to?" and, "Where will to-morrow come from?" do imply that the days are regarded as real things. He refers to a child who thought of a year as a round thing having the different festivals on it, and bringing these round in due order by its rotation.

Probably there are here as elsewhere very considerable individual differences. I did not detect any certain signs of "concretism" in Margaret with respect to time.

That there is more time coming in which pleasant things may happen is realised early by some children. Clifford (21 months) would stop crying for a thing when promised it "by and by." After this promise had become thus effective, he would himself, when crying, "suddenly pull up, and with a heroic effort to catch his breath, would exclaim, 'By-'n-by.'"[1] Once, in her 27th month, Margaret wanted to turn into a certain field. "Not that way, Baby," I said. "Anana (another) day," she said quite contentedly, and turned in the direction I indicated.

The building up of the sense of time past is necessarily a slow process. The child is often said to live only in the present, but this saying is, I think, based on rather superficial observation. In her second and third years Margaret loved to be told stories of the "wee baby" that she once was; such stories very frequently led to the request, "Let me be your wee baby," then, if allowed, she would lie in one's arms quite unable to talk or walk.

From the stories of the child's own "short past" one may easily and naturally pass to tales of the time when Mother was a little girl, and every mother knows how such tales are prized. Then stories of things that happened "long, long ago" will help to make *room* in the past, and stories from history will help to fix certain points from which we can count before and after.

While this historical perspective is in course of formation, we must expect to get many incongruous

[1] Sully, "Studies of Childhood."

suggestions as in the following anecdote quoted by Sully. "H. was beginning to have English history read to him, and had got past the 'Romans,' as he said. One day he noticed a locket on my watch-chain, and desired that it should be opened. It contained the hair of two babies both dead long before. He asked about them. I told him they died before I was born. 'Did father know them?' he asked. 'No, they died before he was born.' 'Then who knew them, and when did they live?' he asked, and as I hesitated for a moment, seeking how to make the matter plain, 'Was it in the time of the Romans?' he gravely asked."

As soon as the little student seems ready for it, a time chart should be prepared, and on it in the correct relative positions should be placed pictures of the great men of the past with whose names and stories we are making him familiar. Such a chart might easily remain an eye memory through life, and give to the past a unity and stability, the lack of which is often painfully felt.

In later school life each child should make his own time charts, and individual interests should be allowed scope in them. Thus one child would elect to insert artists, another explorers, and so on.

Space.—A child's sense of space originates in close connection with his power of perception. A baby has some rudimentary knowledge of spacial relations and properties when he can reach out and touch what he sees. His exploration of his own body with his hands, to which he devotes a good deal of time and attention in the latter half of the first year, helps to render definite his conception of near space. As he is carried about the room, or from room to room, or out of doors, he has

pleasing sensations of movement and change. As his powers of locomotion develop, he explores house and garden. He perhaps goes long distances by train. Everywhere there is space.

Some notion of spacial relations seems to be formed early. Late in the sixth month Ruth showed astonishment when by a different route and a different door she was brought back into a room she had just left.

As soon as a baby can get about by himself, he can find his own way in house and garden. But familiar objects are always visible to lead him on.

In more distant excursions he is always taken, and pays little attention to the way. Many adults have difficulty in finding their way in a strange town, even if they have been taken over the routes several times. We always pay more attention to the matter if we find our own way from the first. Hence it is little wonder if a young child gets lost easily.

Even in the thirty-ninth month Margaret's ideas of the probabilities in respect to space were strangely a-wanting. At that time she was being driven back to her home in a cab. When we were quite near it, I said, "Where is your house?" "Is it that way?" she said, pointing *back*.

Children of four or five take quite readily to the presentation of surface in map form. In the gardens which they spontaneously draw in front of their pictures of houses we find the map form largely adopted. Working from this we may start our geography lessons by drawing the garden we would like to have. There is scope here for considerable individuality and initiative. Then maps of imaginary countries may be made in connection with stories. Very soon the school play-

ground or garden may be drawn by the children. No attention should be paid to scale until the children are ready to answer such a question as, Which side of the playground is the longest? Then longer and shorter may be indicated by differences in length of line.

Nothing more exact should be attempted till the child feels the need of it. Perhaps some day a dispute may arise as to which of two children has the longer walk to school. Now is the time to produce a large-scale map of the district. The children will delight in finding their way about on it; and with a little help, or possibly without any, will find some simple means of comparing distances on it.

When the child can count well, he will love to measure distances by counting his steps. Rough maps to scale can then be made, a certain length being agreed upon to represent a step or perhaps ten steps.

When measurement of length is practised, then more exact maps to scale can be made.

The question of direction will arise sooner or later, and the child will have to face the difficulty of angular measurement. Lessons on the compass and probably on the movements of the sun and on the fixed stars will next be required.

The great thing is to realise that each new idea or new process should be like the bursting of a ripe bud in the child's mind. Let his progress be on natural lines from the vague and inexact to the clear and exact. He will often shock your acquired geographical sense. Never mind. Refrain from offering him measures and scales until he feels the need of them; until they are supports, not simply artificial and annoying encumbrances.

CHAPTER V

THE UNLUCKY BABY

THE children whom we have had chiefly in view so far are perfectly normal children; they have been fortunate in their heredity, in their environment, and in their treatment.

All children are, of course, not so fortunate. Many are handicapped by a bad heredity; they do not start well. Others suffer in health from insufficient or unsuitable food. These things sap the vital energy and retard mental growth.

But we are not here concerned with the physical hindrances to Baby's well-being. Not bodily food but mind food is our chief concern.

The importance of supplying the right mind food is not nearly so universally recognised as the importance of supplying the right bodily food.

With respect to mind food Baby may suffer in two ways—from thoughtless neglect or from ignorant kindness.

Neglect.—If Baby's body is well attended to he will be able to look after the development of his own mind to a very considerable extent. He will in time learn to see by his own efforts, even if not assisted by the provision of suitable playthings. He will learn to walk. He

will even learn to speak sufficiently to make his wants known.

He may, of course, learn many things that he would be better not to learn; and when he goes to school at five much time will have to be spent in teaching him things he could have learned more easily at an earlier age, and in curing him of bad habits (*e.g.* of speech) which he should never have been allowed to form.

One cannot say whether his mis-spent infancy will ever be completely atoned for. But in the present state of our knowledge one could scarcely dare to say it will not.

Ignorant Kindness.—When ignorant kindness is the fault the results are often worse.

Mr. Homer Lane, of the *Little Commonwealth*, has given a picture of striking verisimilitude of the life-history of a product of such treatment. The passage deserves to be pondered by every mother.

A boy of fourteen was given into Mr. Lane's charge as incorrigible. During the previous two years he had been birched eleven times by order of the magistrates. According to the official account he had been a good boy till he was eleven, when he suddenly took to thieving, gambling, and staying away from home; and in spite of all efforts to reclaim him he was getting steadily worse.

Every practical psychologist (and by that term on this occasion I mean every sensible person) will agree with Mr. Lane when he says, "I am perfectly certain that the official opinion that the boy suddenly went wrong at eleven is incorrect. He had been building up his anti-social abilities for several years before he finally became a public problem. Also the statement should

have been made that he became worse and worse *because* of the birchings rather than in spite of them."

To find the real causes of this young man's evil ways we must go right back to his infancy. They were a direct product of that ignorant good nature which is every bit as bad for the growing mind as it is for the growing body. The easy-going mother who gives Baby a bit of the breakfast sausage or anything else he cries for is not much more unwise than the mother who hinders all climbing lest he should fall, and who hastens to understand his words no matter how badly he speaks.

Here is Mr. Lane's account of the early years of the boy in question.

"He had his first misunderstanding with his mother at the age of a few weeks. He had been trying for days to get control of his chubby unwieldy fist. He had noticed that it was capable of moving, and would watch it for long periods in its spasmodic and purposeless travels. One day he discovered quite accidentally that he could move it by a certain process of muscular contraction. He tried to direct it to his mouth. Many long hours did he patiently work to make the tiny fist go where he wanted it to go. Sometimes he succeeded, and then his satisfaction was great. He kept at it, always trying to get better control. One day his mother, seeing his effort, and thinking that he merely wanted to put the fist in his mouth, put it there for him. His protest against this interference with his job was immediate and violent. He then began his career of crime. Stiffening his little body, he screamed his resentment, and beating about with his tiny feet and fists attempted to retaliate for the indignity to which he had been subjected.

"His mother then established the precedent that was followed by the magistrate twelve years later, and gave him a dose of paregoric, thinking it was his interior and not his dignity that had been disturbed.

"In spite of frequent interference with his job of acquiring control over his hands and limbs, he persevered and became quite skilful in directing his extremities. Each time he met with success in his efforts he gained confidence in his own powers. The only failure he knew was when some one interrupted him in his work and did it for him, or when he was stopped in his efforts because he was noisy. His skill grew. He found that he could grasp objects with his hands and control them. He could move articles about. Once when working with a spoon he discovered that by slamming it on the floor it produced a loud noise. Here was further evidence of his power, obtained through the sense of hearing. He practised his newest accomplishment so faithfully that his mother, annoyed by the noise he made, and that was so pleasing to him, took the spoon away from him and gave him a rubber toy. Failing to produce any such satisfying results from the rubber as had so pleased him with the spoon, he yelled his discontent and was given another dose of paregoric.

"Two or three years of diligent application to the business of acquiring power over his muscles and over materials followed; his skill daily growing afforded him much satisfaction. He could now pile articles one upon another, and then by one mighty sweep of his arm send them crashing to the floor. Here was double satisfaction. He could build up and he could destroy his work, He always resented any help. One day he was playing

in a pile of sand with a tiny shovel and pail. Here were new difficulties that delighted his ambitious little soul; new fields of conquest. The pile of sand was so large that he failed to feel he could dominate so unwieldy a mass. If he could isolate a small portion in the pail he could control it better. It was difficult. The shovel would turn over and the sand spill out. He knew from past experience that by patient application he would finally gain control of the material. He worked happily, trying repeatedly to fill the pail, not in the least discouraged by the difficulties, but rather stimulated by them. He had never met failure if left to his own resources. His mother, fondly watching him at what she supposed was his aimless play, and pitying his helplessness, thinking that he merely wanted a pailful of sand, and confident that he would be grateful for her help, took the shovel from him and filled the pail. His rage was terrible. He cared not a straw for a pailful of sand. What he wanted was to fill the pail himself to demonstrate his mastery over the material. Then, to crown his misery, his mother, not in the least understanding the cause of his distress, tenderly examined his clothing to see if some pin was hurting him. Such were the daily misunderstandings in his life. Sometimes he was spanked because of his temper, not in the least recognising the reason why he should be thus hurt; but in spite of all the difficulties in his path of learning, nothing could divert him from his chief purpose of mastering things."

Here we have depicted not a bad baby but a good baby—a fine, stirring, independent child that any mother might be proud of.

It takes us a little beyond the limits we have at present assigned to ourselves, yet we cannot resist accompanying Mr. Lane while he shows us how directly and inevitably the combination of such a baby and such a mother led on to the unhappy events described above.

"At the age of five new joys came to him. By means of his imagination, he could make a few objects answer many purposes. His pile of blocks became buildings, habitable and useful to imaginary people and animals. Now there was no enjoyment in destroying his creations.

"He loved to make believe that he was a man, and that he could perform wonderful and heroic deeds of mastery. He liked playing at soldiers, for soldiers could rule others. In all his solitary play the essential element to his satisfaction was some evidence of his power.

"At the age of seven it occurred to him that it would be a great accomplishment if he could dominate other people as his parents dominated him. The soldier astride a broom charging an imaginary foe was nothing but make-believe. He must have real war, for is this not a world of real things? So he engages Tommy Smith in single combat. He does not in the least dislike Tommy Smith, and he harbours no resentment against him as he nurses his bruises and lacerations. He just loves a real battle and to bend Tommy to his will. He delights in the terror that he can so easily create in his little sister by threatening to strike her. The agonised howls of the family cat are sweet music to his ears. Not the least of his pleasures is to be pursued by his irate mother after he has overturned a chair, slammed a door, and yelled defiance at her. There is

something flattering in the violence of his mother's anger and the evidence of his ability to produce such vigorous action in a person who has hitherto so completely dominated him. He courted danger. Frequent chastisements only spur him on to new methods of getting even. He now habitually resents any authority on the part of his mother. His impulse is to disobey every command irrespective of its merits. He becomes morose and sullen while in the home, and spends all the time possible away from his home with other boys his own age. He loves to feel the admiration that his companions render him when he can do something more daring than they. The angry eye and threatening fist of the policeman are still further and more convincing evidence of his greater importance in the world. He glories in the fact that his teacher thinks him the most disorderly boy in the school.

"Gradually, supported by his boon companions, he begins openly to defy all authority. The only activity that now satisfies him is something that irritates those in authority. He would feel dreadfully humiliated to be thought a good boy. He has no respect for any authority other than the approval of his 'gang.' He is caught pitching pennies by a policeman, taken to court and birched. He rejoins his companions, who admire his contemptuous disregard for the magistrate's injunctions. To prove himself undaunted by the law, he smashes some windows. Another birching. More awed hero-worship from the 'gang.' He is kept in gaol for a night, locked in a cell for some misdemeanour, and develops a secret admiration for the grown-up criminals he has contact with. He now brazenly takes his place in the

prisoner's box in the Court and answers questions defiantly, enjoying the distinction of being the centre of attention of the room full of people. The birchings no longer terrorise him. He begins to feel humiliated that he should be treated in such a childish way. He feels himself entitled to more respect as a criminal than is represented by a birching. He has become completely anti-social in his interests."

There is much that we can admire in the boy's character as here depicted. We feel that it is his whole social environment that is to blame for the unhappy pass that things came to rather than himself. Yet there was nothing wrong that might not easily have been remedied. There was no bad heredity. There was no grinding poverty. There was wanting only sympathy, understanding, and the inculcation of positive social ideals.

These things were in this case supplied by Mr. Lane before it was too late. But there are many unlucky babies who do not meet Mr. Lane in time.

Premature Morality.—Some babies suffer from having our adult morality thrust upon them long before they are ready for it. It is easy to make a sensitive child feel a very miserable little sinner. It is less easy to make him understand why he should be obedient, or why he should speak the truth, or why he should not take possession of other people's property if he needs it more than they do.

Perez tells the following anecdote. "The first time that a certain child of my acquaintance, now four years old, told a deliberate falsehood, his mother thought it her duty to punish him. She told him that she was

going to shut him up in the cellar, and she made him go with her down the stairs which led to it. On the way down the child, whose imagination was struck with the importance attached to his fault, and who had begun to feel very guilty, said to his mother, 'But, mamma, perhaps I am not sufficiently punished for such a great fault.'"

The kind of self-importance that was thus awakened is much to be deprecated.

It is, of course, desirable that a child should acquire a habit of speaking the truth, but a first transgression should never be punished.

The first lie very frequently arises from fear of impending punishment, and is a natural and intelligent attempt to escape it. When it is found out, as it is sure to be, the mother often takes the tone that she punishes the child not for the original offence, but for the lie which is a serious sin. The child is humbly ready to believe he has been extremely naughty, but he really does not understand in the least what all the fuss is about.

Another frequent form of the first lie arises from motives which sometimes are altogether praiseworthy. The child has done something which he knows will vex his mother. He hates to see her vexed and unhappy, and to feel that she is not in full accord with himself, and so he lies. Here all that is needed is an explanation that Mother likes her little boy always to say exactly what has happened, and would be more vexed if she thought she could not rely upon him to do so than at anything else that could happen.

After Mother's preference for the truth has been

impressed on the child, and after he understands what the truth is, any lie should be punished by its natural consequence—a temporary diminution of trust. But care should be taken not to let the child feel himself regarded as a sinner. He has merely shown that one cannot yet quite depend on him. But he is growing older every day, and so one confidently expects that very soon one will be able to rely absolutely on his word. This hopeful looking to the future should be the attitude adopted in all our dealings with the child.

It seems to be assumed by many people that a child has an intuitive or inborn appreciation of the fact that to tell the truth is right, to tell a lie is wrong.

This seems to me very doubtful.

Children's natural tendencies in this matter have need of much more dispassionate observation than they have yet received.

When she was about two Margaret used often to cry when she awoke from her daily sleep. She knew we did not like her to cry, and she used to deny vigorously that she had done it. We thought she had a hazy notion that by denying it she could, as it were, annul the crying, make it not have happened.

Many cases of early lies might perhaps be explained in this way.

No great stress should be laid on such lies. The child should be allowed to grow gradually into the knowledge that no amount of asseveration will alter the past.

Accuracy should not be expected or demanded from little children when they are giving accounts of events. Their minds are so plastic to suggestion that by a

leading question or two one can easily modify the past as it exists for them.

Children should be trained to accuracy: they should not be assumed to be capable of it without training. Accuracy is possible only to trained minds.

The unlucky baby, however, has often a mother who, while she is shocked at his lapses from the truth, is not over-scrupulous with regard to it herself. When, for example, little social amenities, such as saying, "I am delighted to see you," to a visitor, when to the child's knowledge this is far from being the case, are practised under his observant eye, we cannot wonder if he arrives at the conclusion that the truth is not necessarily the rule for every day.

Nor is this the only way in which his mother, in her own person, flouts the rules she lays down for him.

"Do that again and I'll tell your father." "Wait till you get home, my man, and I'll teach you how to behave." Such vague and empty threats are frequently heard by the unlucky baby as he grows up and begins to assert his own will. Unfulfilled promises of whatever kind are breaches of faith with a child.

Another common form of doing despite to the truth is in answering the child's questions.

A sympathetic and successful teacher of small boys was often asked questions of a very intimate nature by her little scholars. One of them once said to her, "I ask you this, because I know you will tell me the truth."

What did this imply with respect to the mother, to whom he should naturally have gone?

Obedience.—Many careful and conscientious parents set up obedience as the cardinal virtue of childhood.

There are, of course, times when prompt obedience is necessary for the child's own sake. But many a child is made disobedient and obstinate because he is ordered to do a thing when he ought to be requested. A command wakes the child's self-assertive instinct, and so provokes a refusal, whereas "Please" would act like a charm. The "You-must-do-this-just-because-I-say-so" attitude is an attitude which any child of spirit is bound to resent.

The old idea that to "break a child's will" is (from any point of view) a desirable process is dying out, but it is still found sometimes in the parents of the unlucky baby.

CHAPTER VI

MEMORY, IMAGINATION, AND PLAY

Adult Memory.—Memory in the adult usually takes the form of mental images. When we recall the past we picture its scenes in our minds; we also hear over again the voices and other sounds that formed part of the total experience. Sometimes we are aware of reproductions—images—of associated bodily sensations. Thus if we call to mind a hill-climbing expedition we may detect not only visual and auditory images, but also reproductions of feelings of bodily strain, of muscular fatigue, of the exhilaration connected with the fresh mountain air.

Every sense has its own memory. The vividness of the images pertaining to each of the senses varies very much in different individuals; mental pictures may be the prominent feature in the memory of one person, while sound imagery stands out in another. Motor images and organic or bodily images are more easily overlooked. They play a more important part in the total memory than is generally recognised.

Some people do not employ this image memory. They remember the past and can reproduce it in words, but they have no images in connection with their description.

It has been thought that this "abstract" memory results from much practice in abstract thought; that it results from the memory having been chiefly used in realms where sense images are inappropriate. It has been thought that the people who remember in this "abstract" way have once had "image" memories, but have allowed them to atrophy.

More evidence bearing on this point is very desirable.

Early Form of Memory according to Perez.—Perez believes that what we may call the picture memory is formed in the infant. The following sentences embody his view. "The child, hardly a month old, who recognises his mother's breast at a very short distance, shows by the strong desire it has to get to it, that this sight has made an impression on it, and that this image must be deeply engraven on its memory. The child who, at the age of three months, turns sharply round on hearing a bird sing, or on hearing the name Coco pronounced, and looks about for the bird-cage, has formed a very vivid idea of the bird and the cage. When, a little later, on seeing his nurse take her cloak, or his mother wave her umbrella, he shows signs of joy and pictures to himself a walk out of doors, he is again performing a feat of imagination. In like manner, when at the age of seven or eight months old, having been deceived by receiving a piece of bread instead of cake, on finding out the trick, he throws the bread away angrily, we feel sure that the image of the cake must be very clearly imprinted on his mind. Finally, when he begins to babble the word papa, at the sight of any man whatever, it must be that the general characteristics

which make up what he calls papa are well fixed in his imagination."

Another View.—I do not agree with Perez in holding that the evidence he brings forward shows that the power of forming mental pictures is already present in the first few months of life.

It is a matter of common observation that we can recognise much more easily than we can image. Thus, if I have met a man only once I might be utterly unable to call up in my mind any image of him, yet I might recognise him at once if I saw him again. Similarly, every one probably has had the experience of being utterly unable to recall a name, yet at the same time feeling perfectly certain that one would know it if it were pronounced.

I think, then, that the fact that Baby behaves appropriately in the presence of certain objects by no means shows that he is capable of forming images of these objects.

The child understands language before he can speak. That is, he recognises words before he can form images of them. This also, in my opinion, goes to show that there is a kind of memory that comes before image memory.

First Form of Memory.—Memory shows itself first in the modification of the present by the past—in what we call understanding and expectation; but at this stage there need be no reproduction of the past as distinct from the present. If one is living in constant touch with a little child one constantly perceives the influence of the past in his speech and conduct; yet

one feels that the child himself has no thought but that his speech and conduct originate entirely in the present.

This view seems confirmed by the fact that very few people have any recollections belonging to an earlier period than the third year of life. Even these recollections are few in number and very fragmentary, as if the power of memory were just in its infancy.

According to this view the beginnings of memory are found in the associations which gradually give meaning to the child's world. The putting on of his hat comes to mean going out, the appearance of his father comes to mean a game, and so on. But this acquisition of meaning does not necessarily imply that the child forms pictures of scenes in previous walks, or of incidents in previous games.

Such memories are automatic, and depend on the stimulus of perception. In the instances given, an important factor in the memory is the feeling of pleasure. An experience may, thanks to past experiences, become pleasurably toned, and so give rise to smiles and joyful movements, before the child has any clear expectation of what is to happen next.

This kind of memory is present long before any voluntary recollection of the past is possible.

Even after he is able to speak, the child often appears to have a very poor memory if we question him about the past. Yet the power of an actual perception to wake the past which sleeps in him often rouses our wonder.

Instances of Early Memory.—I will now give a few instances of early memory which do not seem to

me necessarily to imply the presence of "free" memory images.

We have already seen that a baby of a few weeks old behaves in a different way when he is carried into an unfamiliar room. The power of recognition is present. We may, I think, legitimately suppose that a feeling of familiarity is now associated with the perception of the accustomed room.

Faces and methods of holding and voices are recognised in the same way in the first few months of life. Each calls forth its appropriate reaction.

The following example from Sully seems to indicate a somewhat higher level of memory.

"A little girl when only nine months old was on a walk shown some lambs at the gate of a field. On being taken the same road three weeks later she surprised her mother by calling out just before arriving at the gate, 'Baa, baa.'"

Even here it is not, I think, necessary to suppose that the little girl had a clear visual memory of the lambs. The striking sound may have become so closely associated with the whole walk experience that when the critical point was approached the child felt impelled to make the sound without herself knowing why.

Margaret in her sixteenth month after an absence of eleven weeks from home seemed to find the rooms quite familiar. When she saw the piano she began to hum and wave her finger. She had not practised this action before she left home, nor had she seen a piano during her absence.

Walter at seventeen months had been to see a friend who lived upstairs in a flat. He was told he was going

to see "Aunt Jew." Two months later he was taken to another flat. He looked up and remarked "Aunt Jew."

When she was two and a half, Margaret spent Christmas in Edinburgh, and played a few times with a solitaire board and some glass marbles. The following Christmas she was again in Edinburgh, and in a friend's house was shown a solitaire board and marbles. She at once came to me and began to inquire about the marbles in my house. I feel quite sure that the memory had not been vivified by any talk in the year's interval.

I could give several similar instances of perceptions calling up past experiences which had seemed to be quite forgotten.

I question whether the experiences in any of the instances given were revived in the form of pictures.

When does Image Memory first show itself? In some of the instances given there may, of course, have been fragmentary images present. The evidence is inconclusive. In support of his view that image memory is possible at a very early age, Perez quotes the following example from Carpenter's "Mental Physiology."

"Several years ago, the Rev. S. Hansard, now Rector of Bethnal Green, was doing clerical duty for a time at Hurstmonceaux in Sussex; and while there he one day went over with a party of friends to Pevensey Castle, which he did not remember to have ever previously visited. As he approached the gateway, he became conscious of a very vivid impression of having seen it before; and he seemed to himself to see not only the gateway itself, but donkeys beneath the arch, and people on the top of it. His conviction that he must have visited the castle on some former occasion,—although

he had neither the slightest remembrance of such a visit, nor any knowledge of having ever been in the neighbourhood previously to his residence at Hurst-monceaux,—made him inquire from his mother if she could throw any light on the matter. She at once informed him that, being in that part of the country when he was about eighteen months old, she had gone over with a large party and had taken him in the pannier of a donkey; that the elders of the party, having brought lunch with them, had eaten it on the roof of the gateway, where they would have been seen from below, whilst he had been left on the ground with the attendants and the donkeys."

This is a very remarkable instance of the way in which an actual perception can penetrate the recesses of the mind and drag forth material which is not even recognised as being derived from an actual past.

Further evidence on these lines is desirable.

Meantime it seems to me a tenable theory that visual imagery first appears in dreams. At all events one may, I think, assume that when Baby begins to dream, he is able to see pictures with the eye of the mind.

The first evidence of dreaming given by Ruth occurred in the last week of the fourteenth month, when she called out in her sleep. Again in the eighteenth month she woke in the night and immediately demanded "Do" (outdoors)—a demand which seems to show the influence of a dream. There is better evidence of dreaming in the third year, but dreams are still few and fragmentary.

In the fourth year Ruth showed a tendency to mix her dreams with reality. Most of them, however, vanished quickly from her memory. In the fifth year she began

to talk of them in such a way as to show she quite understood their illusory nature.

Imagery in waking life is less easy to establish. I am told that Margaret, in the second half of the fourth year, sometimes talked of seeing "'flections" of people as distinct from real people, but I have not been able to investigate this farther.

Clifford began to speak of his dreams in his fourth year, taking for reality all that he had seen in dreamland.

Before this time he had shown himself possessed of considerable power of remembering the past. Early in the third year he spent a month at a farmhouse. "Nine months after this visit his father was talking to him about the game of cricket. He then said, "*Oh*, yes" (his favourite expression just now when he understands), "I 'member. Jingo ran after ball down at D——." As a matter of fact, his father and friends used to play tennis at D——, and Jingo, the sheep-dog, did pretend to field the balls, often in a highly inconvenient fashion."

This remark of Clifford's in its nature and its detachment from the present strongly suggests that memory images played their part in his mental life. It is not, however, certain that these images took the form of pictures. It is, to my mind, significant that what was remembered was a movement.

Sound Imagery.—Sound memory shows itself in the early months in the form of recognition of the mother's voice. But I do not know when sound imagery first appears. Possibly when a child can reproduce a tune. This sometimes occurs in the second year.

Motor Imagery.—Motor memory shows itself very

early. We see it in the way a little baby adjusts his limbs in the processes of dressing and undressing. We see it in the way he learns to feed himself, to handle his toys, to manage his body. Motor memory is the foundation of habit. It shows itself in the association of certain acts with certain sense experiences, as when Baby waves his hand when he hears the sound "Wavetata." I do not detect motor imagery in connection with this primitive motor memory. But undoubtedly motor imagery comes to play an important part in the mental activity later. Thus many people cannot call to mind a period of great physical exertion without, as it were, feeling it all over again.

Memory by Self-projection.—Most writers on child psychology assume that the power of making vivid mental pictures is *the* characteristic memory of childhood.

Here is a typical example.[1]

"A train picture book was given to Eric when he was two years old. He opened it at the first page, saw an engine, and, with a glad cry of recognition, puff-puffed hard round the nursery! He turned to the next page, another engine! Again he joyously carried the thought into action. The child is capable of forming mental pictures so clearly and definitely that he enjoys them as if they were real."

Now this is a typical instance of the way childish memory shows itself; but I do not think the conclusion founded on it is justified.

Eric very possibly had no mental picture of a moving train. He expressed the idea "train" by means of quick

[1] "The Dawn of Character," by Mrs. Mumford.

motion and the puff-puff sound. Sound and motion—these were for him the meaning of train. He projected himself into the train; for the moment he *was* a train. But for that very reason he did not see it.

Margaret's way of "remembering" herself as a "wee baby" is, I think, suggestive in this connection (see p. 72).

I was once teaching two or three little girls of about eight years of age.

They had been reading a story, and they were attempting to draw a scene in which dogs barking round a camp were a feature. Commenting on one of the rather wooden dogs, I said, "That's not how a dog looks when he barks."

"No, this is the way," cried one of the little artists; and in a moment she was on the floor, with her head held up, giving utterance to a series of most realistic short yaps.

Before I could say anything the other children followed suit, showing by their action how vivid was this "self-projection" memory in contrast with the poor quality of the visual memory, as shown by their drawings.

It is this form of memory, which is motor, not visual, that is the memory most characteristic of childhood.

If this is so, it accounts for the fact that movements make a strong appeal to the memory of children.

We have seen this already in Clifford's memory of the sheep-dog running.

Not long ago Margaret (50th month) supplied me with an excellent instance of the part played by movement in her memory.

She was looking at an advertisement which depicted a woman sitting on a world. In response to an inquiry I told her it was the world.

M. "Is it the world that moves so quickly?" "Yes." "Does this one move?" "No, that is a picture; it doesn't move in the picture."

M. "I saw people really walk in a picture."

I. "No." She has never been in a Picture-house.

M. "Yes, they were in a picture, and they really walked—not here—in Manchester. Yes, when the woman pulled the strings" (going through the movements of some one pulling strings).

I then remembered that, about ten months before, she had paid one brief visit to a Camera Obscura at Dumfries and seen pictured people walking as she said. Not much had been made of the incident at the time, and I don't think any reference had been made to it since.

The interesting thing to me was the way the memory fortified itself by the reproduction of the woman's movement, a movement that one had no idea had drawn the child's attention specially at the time. Be it noticed that the movement was not revived as a picture, but as an actual movement of the child's own arms.

The easy projection of the self into other people, animals, and even things that is found in dramatic play is quite in harmony with the kind of memory here illustrated.

Verbal Memory.—Little children's memory for words often surprises their friends. This, of course, cannot be a visual memory; it must be either a sound memory or a motor memory. In the case of a musical

child who recognises tunes—more especially if he can also hum them—one would suspect a sound memory. In this region individual differences among adults are great; the beginning of this differentiation is almost certainly found in the very early months of life.

Of Walter when scarcely two and a half his mother says, "I could not tell you the number of songs he can sing and the rhymes he can recite. He can do several with three verses without help. He speaks exceedingly well, using long sentences."

Margaret has a good verbal memory for words used in her hearing. Here is one example. In her thirty-first month I slightly cut my finger, and the child was much interested in the application of a small piece of sticking-plaster. Three months later, one day when I was playing with her, she suddenly demanded, "Is the sticky paper off your hand?" "What sticky paper?" I said; "there wasn't any on." "Yes, in Edinburgh there was." "No, what do you mean?" A great effort on her part; then, "The plaster-stick. Is the plaster-stick off your hand? Is your finger better?"

This, I think, was pure motor memory. We had been playing with plasticene just before, and the use of that word probably helped to drag up the memory. The instance is a valuable one as showing the queer senseless automatic character of many of the child's memories; for, of course, Margaret knew perfectly well there was nothing the matter with my finger. If children were given to wondering about their own behaviour, I think she would certainly have wondered at her own question.

My belief that Margaret's memory for words is a motor memory is strengthened by the fact that before

she learned to speak she would pay extraordinary attention to the movements of the lips of those talking to her. Moreover, she has never shown much tendency to pick up rhymes, and at the age of four she knows no tunes.

A good example of the tenacity of this motor memory is given by Professor Graham Bell of Washington. He had been testing a child about nine years old, deaf and blind from her fourth year, "as to her ability to reproduce by motor imitation the movements of the throat and mouth involved in articulate speech. She succeeded fairly well, pronouncing the letter *k*, which offers peculiar difficulties to deaf-mutes, with unusual distinctness. When asked to repeat the letter some hours later, she called with an almost perfect enunciation, 'Kitty, Kitty, Kitty.' Investigation revealed the fact that when, at the age of four, the gradual loss of speech had followed that of sight and hearing, the last intelligible word spoken by the child was 'Kitty.' The reproduction was unconscious, the child having absolutely no idea of what she had done. It was not, then, a reproduction of the word as heard or as associated with something seen, but a muscular movement which, latent for five years, was recalled by the suggestion of a similar movement."

We make use of this motor memory when, having forgotten the end of a line of poetry, we keep repeating the first half, and finally, after many attempts, arrive with a sort of rush at the desired end.

Practically all normal children by the age of four have acquired with ease a vocabulary large enough to express their needs and ideas. The size of vocabulary seems to depend less on the ability of the child than on the opportunities he has to obtain ideas, and of course

on the conversation of those round him. We should take advantage of the extreme facility with which the child learns words, and not be afraid to give him correct terms from the first (cf. Chap. IX.).

Imagination and Play.- -Memory in most people is a form of imagination; it has been fitly called Reproductive Imagination. It is bound down to reality—the reality of the past.

When we speak of Imagination, however, we usually have in mind the power which enables us to transcend reality—to mould it to our will. By means of this creative imagination, as it is called, we leave the real world and fashion one more to our liking.

In the little child imagination and play are very closely inter-related. Imagination, in my opinion, first shows itself in connection with the child's play-attitude to pictures.

Margaret, in the fifteenth month, would sniff pictured flowers; in the twentieth a favourite game was to gather pictured fruit and present it to everybody to eat. Probably all children take spontaneously or on the slightest suggestion to games like this. At this stage I am sure Margaret would have protested had she been shown a real biscuit, and not been allowed really to eat it, when it was put to her lips. The pretence eating, however, affords entire satisfaction when the object is a pictured one. I think, then, that such games do not indicate any illusion about the nature of a picture. They are simply the early forms of the long-lasting game of "Let's pretend."

In the thirty-first month I showed her a picture with a fire in it. When I casually laid a finger on the fire

she was greatly concerned lest I should have hurt it. Here she may have suffered a momentary illusion, being carried away by her feelings.

The following parallel incidents are afforded by Ruth. In the twenty-fifth month, moved by sympathy she tried to lift a branch that lay across a pictured lamb. Again, in the thirty-fifth month "looking at a picture of a chamois defending her little one from an eagle, she asked anxiously if the mamma would drive the eagle away, and presently, quite simply and unconsciously, placed her little hand edgewise on the picture, so as to make a fence between the eagle and the chamois."

That the attitude of illusion is playfully adopted by children is, I think, shown in the way they address pictures. Thus in the thirty-fifth month Margaret was looking at an American picture of two babies who had quarrelled. "Hasn't that baby an awful face?" she said of the cross baby. I said, "The other one wants to be friends." "Will she be friends?" "I think she's not very sure yet." *M.* (to picture) "Are you welly sure?" (to me), "Is she welly sure?"

In the thirty-eighth month the child's playful attitude to pictures came out more clearly thus. She was asked concerning a little boy in a picture, "Will you marry him?" "I can't marry him," she replied, "he's in the picture." But a day or two later she ingeniously got over this difficulty. Some one was drawing a bicycle for her. "Will anybody come and ride on it?" she inquired; "Who will?" "Will you?" "Yes, in the picture I will. Make me ride on it." In the forty-fourth month she said of a pictured flower, "If I was

in that picture I would pluck it, and you would say, 'What a nice little girl.'"

Play Attitude to Things.—The child's attitude to pictures is closely paralleled by his attitude to things, and to parts of his own and other people's bodies. Many babies—perhaps most—like, if given the opportunity, to feed their own toes. Here the fact that the food is not taken does not disappoint them in the least; though, when they wish to feed their mother with their crusts, they often do not at all approve if she does not really eat.

An illusion with regard to things is fostered by many adults, who, when Baby bumps against the table, distract him from his hurt by saying, "Oh, the poor table. Look and see if you hurt it." Baby falls in with the suggestion so readily, however, that it must correspond to something in his own nature.

Whether the notion is derived from some little noticed suggestion or not, it seems certain that some children really attribute sensibility to inanimate things. Thus Miss Ingelow, when a little girl, used to carry pebbles along the road in order that they might have the pleasure of a change of view.

Such childish ideas may continue unacknowledged by their owner far into adult life. They may be at the back of some people's irrational attachment to their household gods. Such people cannot bear to part with the dear old things that have shared with them so many joys and sorrows.

In Margaret's case up to the present the illusion seems to me to be entirely playful.

In the twenty-seventh month I saw her giving "cakie

a tickta" (watch), and another day she took off her socks to let her toes see some pictures. One day in the thirty-ninth month she was trying to squeeze past two chairs in which her mother and I were sitting; after we both avowed our inability to let her pass, she addressed her mother's hand, saying, "You make room, handie."

Dolls.—The doll, of course, is a thing by itself, and may be endowed with life by children who attribute life to no other thing. Its importance in connection with the emotional development of the child is universally recognised.

Part of Margaret's doll play centred round a little celluloid doll which was known as the Baba, and was frequently asked for. In the thirty-second month the child, when in her bath, would address the Baba, earnestly asking if it did not want to come in. I would answer for the Baba in a squeaky voice. Margaret would watch my lips while I was doing this, but she always looked straight at the doll in giving her replies. Sometimes she would reply for the Baba herself, thus showing that the whole thing was to her a play.

Dramatic Play.—In dramatic play children early find a way of expressing their ideas and of gaining new experiences. This mode of self-expression, like any other, is not merely self-expression: it is also self-expansion.

In this kind of play some children seem to lose their own personality entirely, and are much perturbed if addressed or treated in an everyday manner. Thus

one little girl of four burst into tears when her mother came into the room and kissed her. By way of explanation she sobbed out, "Mother, you never kiss the man in the shop" (Sully).

In her twenty-sixth month Margaret acted her first drama. It was a real drama in that it required spectators, thus differing from her later dramatic plays with her dolls. She sat on the floor, having first placed a cushion in readiness. She then said, "Baby lie," and lay back. In a moment came the words, "Baby up," and up she came. Then with great emphasis she ejaculated, "Ba' baby," and gave herself a vigorous slap on the hand. This she did several times, looking with twinkling eyes at us each time the little play came to an end to see if we appreciated the joke.

While simple dramatic play is found to some extent in the third year, and even occasionally towards the end of the second, it comes to its full luxuriance in the fourth and fifth. Most children seem to throw their entire selves into their play and forget or transform the real world altogether for the time being. Some children, however, right in the midst of the illusion will spring reality upon one in the most startling way. Margaret had a set of most accommodating bricks which, in their time, have acted many parts. A game of which she never tired was to wrap up the bricks in a piece of paper and hand them to any one who would accept them, saying, "Here's a long-tailed baby for you," or a perambulator, or a cab. Sometimes she supplied the names herself; more often she demanded, "What would you like next?" In this game the colour of the brick sometimes appeared in the announcement, as in, "Here's a

nice purple round tomato for you." One day she asked for her little chairs and tables, adding, "And some people called bricks will sit on them."

A little drama belonging to the forty-seventh month which I noted down at the time will show the amazing quick change of personality that occurs together with a solid background of reality. Of course the child did not know that I was paying any attention to her. She probably accepts me by this time as a person with a mania for writing. The scene, I think, must have been a railway station. The materials were a broken box, a piece of paper, a piece of stuff, and the ever-obliging bricks. I took no part, but was occasionally appealed to in my own personality. "—— and then you see the porter'll take it in the van, and here's a little girl packing for the porter to take it if he likes. I'm packing, Auntie. That's all." (The box seemed full.) "What about this? Yes, I think it'll do. Here's the paper to wrap it up in. Oh, she's got to pack it all up again. Put it in the thing for the porter. This paper she wants to wrap up in. She'll put this in here. She'll take all these things out and put them in here. THANK YOU. The porter is saying thank you to me for putting the things in here. I'm putting the luggage in for the porter. Here's the lid. Here, Auntie, lots of things in here for you. You see I was the porter taking them in the train. There's boxes in here for you to pack in p'tence packing."

At this period many examples were noted of this incongruous mingling of fancy with fact.

The flow of language that accompanies this dramatic play is extraordinary, and ought to make us

ashamed of the halting results we get when we attempt to teach children composition.

It was the fulfilment of a long-cherished desire when Margaret received the gift of a doll's perambulator (forty-seventh month). After it arrived she played with it and her dolls for fully an hour and a half talking incessantly, and so fast, that occasionally she had to pause for breath. I was able to take down only part of her monologue which was accompanied by the appropriate actions.

". . . I better cover them up well, you know. I tell you which dollie I'll take out to-morrow; in the nice warm summer days I'll take it out. This one has to cry for her bottle, for she can't speak. But she'll soon grow up. They soon grow up, don't they? I would like her to grow a big girl just as soon as I did. It's a pretty wee pram, you know. She's a pretty wee baby: six months. Isn't she little for her age? She lies down, you know. Sometimes I cover them up well with shawls and all other things. It's a pretty wee dollies' pram, isn't it? She's a awfully good baby. It's time for her to go home. It's time for those sitting up beside you to go out. It's best to keep them cosy in this weather. Put your hands in, dolly. . . . It's best to put shawls over when they're this age. She's only twenty months, and they go all the way to town by themselves in the tram, and they get a nice sweeper for their mother. I'm their mother, you know. . . . I better turn, for my dolly wants—they want to sow seeds in the Park. Does the Park turn your way, Mister? Well, my children want to sow seeds in the roads, will you let them. . . . Best to put woolly things over them in

weather like this; it's the best thing I could ever do for them, and my Nana's going to make real covers; isn't it nice of her? For these are not real covers; they're only 'tence ones. . . . The youngest one likes the fresh air and the oldest one doesn't." (Her mother here said, "You must train her up to like fresh air.") "I trained her up some time ago, but she doesn't understand yet. . . . Put your handies down and sit up propertly. . . . I better be turning. You see it's snowing, and I want to go to the shelter. . . . Now it's time for those to go home. Now you'll stay with the wee baby. They better be all good and nice, for I don't like naughty children. I don't like foolish children that tear all their frocks, that kick off all their covers when they're six. . . . I better put the hood up, for it's snowing, to shelter the baby from the snow. I don't like the baby to get snow in its eyes. Shame, wouldn't it? Then you'd have to put your mouth in their eyes and kiss their eyes. . . . It's best for them to stay in the pram when you're going in—when the other person's going in, it's best for them to make themselves happy and kick about. I like happy children, don't you? . . . The baby's going to sleep in the pram; you see she's a wee baby, she likes to sleep in her pram; it's well to tuck little things like that well in." (Some one said baby would cry if left in the verandah as she proposed.) "I would get up; I could get up quite easily; it doesn't bother me when they cry. . . . I'm tucking her well in. I'm tucking her wee toes in. She likes to sleep out in her p'etence garden. . . . I better take her in the sun. She likes to see a shadow of herself, so I let her. . . ."

This passage is, I think, quite typical of the composition of a four-year-old. There is, it is true, much repetition; but there is a ready flow of ideas, and without the slightest hesitation or difficulty words come to embody these ideas.

This fluency is too often lost in school; the reason being that teachers do not recognise its presence, and so offer it no scope. They attempt to lay a new foundation for their own superstructure; in this way not only is time wasted, but a less stable product results.

Tell Me a Story.—Stories often form the foundation of dramatic play, and the zest with which children take to dramatising stories shows how natural this mode of reproduction is to them.

We may, I think, in this region find further evidence that the child's visual imagery is poor in comparison with his power of self-projection. For example, Margaret (forty-eighth month) was playing the Ugly Duckling. The dog found her by the wayside and asked her how she came there. *M.* "I ran and ran and got into the cab and it took me to the station, and I got into the train."

One can scarcely suppose the child formed a picture of the duckling stepping into a cab.

The demand for stories forms an epoch in the education of the child. There is no end to the information and the culture that can be given by their means.

The story hour should have an honoured place in every school and every nursery.

Alternating Personality.—Alternations of personality sometimes play a very helpful part in the

teaching of manners and morals. Canton brings this out in his delightful description of his little girl, W.V.

"As decorum at table is one of the cardinal virtues, W.V. dines by proxy. It is her charming young friend Gladys who gives us the pleasure of her company. It is strange how many things this bewildering daughter of mine can do as Gladys, which she cannot possibly accomplish as W.V. W.V. is unruly, a chatterbox, careless, or at least forgetful of the elegances of the social board; whereas Gladys is a model of manners, an angel in a bib. W. V. cannot eat crush, and rebels against porridge at breakfast; Gladys idolizes crush, and as for porridge, "I am surprised your little girl does not like porridge. It *is* so good for her."

Margaret was herself a good child; but there was a nasty baby who sometimes appeared, and was known by her ugly way of speaking. On one occasion I sent away the nasty baby, saying, "I don't like you; go away and send the nice baby." The nasty baby obligingly went off. In a few minutes I called, "Have you not found the nice baby yet?" Back came the ugly voice, "Naw, boot Ah'm lookin' for her." I waited, and very soon a smiling person appeared, and was at once welcomed as the nice baby.

The variation of personality may, of course, have its inconveniences as well as its conveniences, as when we get hold of an ingenious Dr. Jekyll, who entirely refuses to accept responsibility for the misdoings of his Mr. Hyde.

Imaginative Assimilation of Other Things to the Self.—The child, it has been often said, is an egoist through and through. There is truth in this saying—

but there should be no reproach in the term as thus used. In every child the world begins anew; and the world and the child develop together. Each child is bound to be the centre of his own world. Every one recognises this self-centredness as a right in King Baby; but often when babyhood has passed away the condition remains and is subjected to unmerited reproof.

Sully tells of a small boy (much wanting in the virtue of humility) who was once asked by a visitor how he imagined the world went round before he arrived in it. The boy was quite equal to the occasion. "Why, it didn't go round," said he, "it only began five years ago."

A more pleasing method of enfolding all things in one's own personality is found in such questions as the following: Where is the sun gone? Is he having his supper? Is he asleep? Where is the moon's house? Are the birdies asleep in their cots?

One evening Margaret and I were watching some men playing bowls. Next morning we passed the same place, and no one was to be seen. She at once raised the question, "What are the men doing now?" I made some suggestions, none of which gave satisfaction. Finally she enlightened me thus: "*I* think they're in their houses playing with their bricks."

It is only very slowly that a child forms any adequate notion of society, and generally speaking he does not receive nearly enough help in this difficult task.

The notion of the family as including a father, a mother, and a baby, of course comes early, and is often applied in an amusing way. Thus one morning a proof came for me in three strips, a short one and two long ones. Margaret took possession of them. "Is it a little

newspaper?" she inquired, taking up the short strip. Then she added with reference to the others, "This is the big father and mother newspaper, I suppose."

The early notion of the family seems to be just this one of relative size.

In the thirty-eighth month Margaret inquired of her mother, "Will you still be my mother when you're old? Some day you'll have stopped being that, won't you?" The true concept of the mother is not often formed before the tenth year.

The eager demand for names—so persistent in many children—is probably an example of assimilation of things to the self.

In the thirty-second month Margaret would constantly ask the names of things, as if she expected them to have names like people. After being told what a thing was, *e.g.* ivy soap, she would persist, "What's its *name?*"

In the thirty-fifth month the following conversation took place. *M.* "What is the name of this road?" Oxford Place. *M.* "Is that its Margaret Anne name?" This seems an attempt to express the idea embodied in the term Christian name—one's own personal name as distinct from the family name.

Sense of Fun.—One would not expect a sense of fun to appear very early. During the first few months Baby is too much engaged in the serious business of learning to live to have any appreciation of the lighter side of life.

Early in the fifth month Margaret found it very funny to ride cock-horse on one's knee and be dumped down sharply at the end of the verse. The dump was specially provocative of laughter.

In the sixth month a very distinct sense of fun appeared. At that time her mother wrote, "I think she plays with me, *e.g.* I take her hands and say, 'Up, Baby.' She pretends to try, but won't come. Then she laughs. We repeat this several times. She cries if I don't go on. She really wants up all the time, but must have her little joke about it first. She can come quite easily. Sometimes she seems almost on her feet when one has only just got hold."

In the seventh month she would smile broadly or laugh aloud if one pretended to sneeze. For a long time a sneeze was a never-failing joke in baby-language.

Sully thinks that it is the upsetting of the established order, a topsy-turviness of things that appeals to the sense of fun in children. Margaret in the seventh month seemed to agree with him, when she found it very amusing to get hold of the wrong end of her bottle, and also in the twelfth, when by throwing herself back on my knee she obtained a view of her mother upside down. In her fourteenth month I set a box on end and blew it down. This was very funny, and Baby gave me many encores.

In the same month she would sometimes put her head down on her mother's shoulder, as if going to sleep; then lift it and laugh as if that was a great joke.

In her twenty-eighth month a little boy friend turned somersaults for her, and this she found intensely amusing.

In the thirty-fifth month mispronunciations caused great amusement. Thus one day Margaret was looking at a book with her grandfather. He said, "See, anozzy pic." She at once left him, and coming to me remarked with great amusement, "Gran'pa said, 'Anozzy pic.'"

A little later her own verbal slips, which occurred with tolerable frequency, were often the subject of amused comment.

One morning (fiftieth month), after putting on her socks, the child was lying on her back in bed, moving her toes and reflectively watching the motion. "I used to laugh at that," she said, "when I was a wee baby." I agreed. "It is a bit funny, isn't it?" I again agreed. "Was that why I laughed?"

I do not know whether sarcasm is due to a sense of fun, but I was somewhat surprised to find Margaret at this time quite able to appreciate and indulge in this figure of speech.

I had just said, "I must heat grandpa's coffee." The child brought out one of the rather automatic "why's" which were common at this period. I commented on this foolish "why," and told her she knew why one heated things. She denied it. "Well," I said, "I'll tell you. You heat things so as to make them hot." "Oh," she retorted without a shade of embarrassment, "*I* thought you heated them to make them cold."

Educational Application.—Whether the imaginative activities described in this chapter are helpful or harmful to the child manifestly depends on the nature of the copy with which he is supplied.

Of a little new-comer to one of the Edinburgh Free Kindergartens, the Kindergartner writes, "She is underfed and underclothed. Her favourite occupation is to play being 'junt' (drunk); which she does with horrible realism."

CHAPTER VII

SYMPATHY, SUGGESTIBILITY, AND SELF-CONTROL

Sympathy.—Laughter is infectious, we all know, and this infection of laughter is an example of the primitive form of sympathy. When one baby in a hospital ward begins to cry, the other babies soon take up the woeful tale. Fear is "catching" in the same way. Speaking generally, we may say that gregarious animals tend to develop any emotion which is manifested by others of their kind.

This tendency to "catch" emotions from others is clearly of the utmost importance in the case of the growing child. If the child constantly sees exhibitions of anger, he will tend to develop a passionate temper; if he constantly sees other people curious about things and interested in them, he too will be curious and interested. I am convinced that the extraordinary difference in rate of progress and capacity that one sees in young children under school age is dependent to a far greater degree than we yet realise on the difference in the emotional infections to which they have been exposed.

The happy household is reflected in the happy child, the discontented household in the discontented child, the inquiring and alert household in the inquiring and alert child.

Within the first six months babies give plenty of evidence of this sympathetic induction of emotion. They will smile at a smiling face and cry if they hear crying. Margaret in the sixth month was reported as immensely "proud" of having cut her first tooth; it is easy to understand how her feeling was aroused.

Mrs. Hall records that in the eighth month "a cry from the mother caused by the child's vigorous use of his teeth was followed by a grieved cry from the child."

When tender emotion is experienced along with this sympathy in pain, one has the impulse to help or defend or comfort. It is this complex mental activity that is popularly denoted by the term sympathy. In an "affectionate" child it may appear early.

An interesting manifestation of this complex sympathy was given by Margaret in the fifteenth month. She had to have some lotion dropped in her eyes at that time, and to make her like the operation better I, one evening, dropped some in her mother's eyes also. Baby watched very solemnly; when she saw the water rolling down her mother's cheeks she wept, then went close to her and "loved" her, pressing her face against her mother's cheek. Next morning we tried again; this time baby wept bitterly without attempting any consolation.

When primitive sympathy develops on these lines it perhaps gives rise to consideration for others and tact. I could certainly give a number of illustrations showing the presence of these qualities in Margaret. The following struck me as showing great delicacy of sentiment in a child just over three. She was wrapping up little parcels one day and giving them to us. "Is that for

me?" I asked. "It is for mother," she responded, handing it to me. "*You give it to her.*"

The sympathetic response to our feelings is very pleasant to most of us; and many people have a real craving for it. Such people cannot even enjoy anything alone Their joy is not joy until they have imparted it to a friend; their sorrow is unbearable until it is shared.

When does this need of sympathy appear in the child?

We probably see it in that looking for approval which accompanies the first successes in walking and standing. From the latter half of the first year onward Baby's appeal for sympathy is constant and very engaging. If he falls and hurts himself, you must be grieved and must kiss the place to make it well. If he is pleased you must share his pleasure. "Come and see me do this," that you may increase my pleasure by sharing it, is a constant cry with the older child.

This particular need of the child must be treated carefully. It is manifestly of social value, yet it may easily become exacting and lead to selfishness. One of the many pitfalls in the path of an only child is that, owing to the love and care concentrated on him, he may become too dependent on the sympathy of others. In this matter there should be give and take. Sympathy should be demanded from the child as well as given to him.

In moral training, sympathy, both passive and active, has a noteworthy part to play. Baby, left for a few seconds alone, has just succeeded in opening the coal scuttle and pulling out some nice black coals. When

mother returns he looks to her for sympathy. She is distressed, horrified at the state he is in. He is saddened because his demand for sympathy is repulsed; moreover he is infected with his mother's distress. He readily acquiesces in the verdict that he is naughty.

It is quite easy to make a little child cry by merely pretending to cry yourself. Much more will he be saddened by the real sorrow of his mother. He readily "repents" when she reproaches him for stealing the jam or telling a lie or making a mess. But this "repentance" does not necessarily mean that he understands in the least why he is called naughty. Indeed it is quite certain that he often attaches the term to the wrong thing altogether.

An amusing instance of this was afforded me by Margaret in the thirty-fourth month. She had been in a somewhat exacting mood, and her nurse had checked her, saying, "You musn't be always saying 'I want.'" "Me want," responded the child good-humouredly, completely missing the point.

Suggestibility.—The little child's acceptance of the verdict "Naughty Baby" may be taken as an instance of his suggestibility.

"Suggestion," according to the definition given by McDougall, "is a process of communication resulting in the acceptance with conviction of the communicated proposition in the absence of logically adequate grounds for its acceptance."

We are all of course susceptible to suggestion. A habit of seeking rational grounds for our beliefs renders us less so. Knowledge in any one sphere renders us less open to suggestion in that sphere. A liberal native

endowment of the instinct of self-assertion works against suggestibility, while a liberal native endowment of the instinct of self-subjection works in its favour.

Children are peculiarly open to the influence of what is known as prestige suggestion. The grown-up people around them are so wonderfully wise and powerful—besides being so much bigger and stronger than they are—that they constantly find themselves in the submissive, believing attitude that favours the acceptance of suggestion.

Children's beliefs in general—and especially their moral and theological beliefs—are almost inevitably the result of suggestion. Beliefs thus implanted are very hard to eradicate, and often seriously affect the after life of the child. It is therefore dangerous to allow our children to associate with people of strong convictions and no scruples about stamping these into the extraordinarily sensitive substance of the growing mind. Even if the convictions are the same as our own, it gives rise to a more harmonious development and a stronger character to have them result as the culmination of a process of thought than to have them forcibly impressed from without before thought properly so called is possible.

Evidence of suggestibility in children is not difficult to find. As we can form innumerable pictures in a cloudy sky, so are the misty masses in a child's mind plastic to suggestion.

Here is an example belonging to Margaret's forty-seventh month. Her grandfather was looking at pictures with her, and said, "That little girl has a dress like you." *M.* "Not like mine. I have got a blue dress with

white spots." Grandpapa denied the spots, but said it had blue buttons. The child demurred. *Gr.* "Did you not know it had blue buttons?" *M.* "Yes, I did." As a matter of fact it was her coat that had blue buttons, not her dress. Margaret, being like most children, a stickler for accuracy in such matters, would never have thought of calling her coat a dress. Her assent was simply due to suggestibility.

It is well known that under certain conditions even sense experience is amenable to suggestion. In the hypnotised state, for example, a man will eat soap with every appearance of enjoyment, if he has been assured that it is sugar.

Suggestion may be administered by oneself as well as by other people. One morning Margaret wished a little hot water in her milk. Her mother said it was no use putting in water, as the kettle had just been filled with absolutely cold water. However, a few drops were added to the milk, with the result that the child declared, "It's not absolutely cold; it made my milk warmer."

There may have been a spice of what is known as contra-suggestibility here.

Owing to their readiness to accept suggestion children make very bad witnesses. By a series of leading questions they can be made to "remember" a great deal that has never happened.

Contra-suggestibility.—An impulse of self-assertion frequently leads to the interesting phenomenon of contra-suggestibility. Here the tendency is to go against the suggestion, to repudiate the belief, to perform the opposite action.

The condition is frequently found in children, and is generally easily dealt with. In such a mood John refuses to eat up his nice porridge like a good boy. "No, of course not," says mother, "no one expects you to eat your porridge like a sensible person. It's cake you would like for your breakfast." John hastens to repudiate this new suggestion, and the end of the matter probably is that he eats his porridge to show his independence.

Control.—We have studied the instinctive activities of the child and seen how these lead to control of his body. We have seen also how certain emotional processes find expression in bodily movements. Courses of action which arise out of developed sentiments belong to a later stage, for in the little child the sentiments are just in process of formation.

Other activities, such as we have seen for example in dramatic play, may be impressed on the child from without. These activities belong largely to the ideomotor class. When there are no counteracting tendencies an idea of action is immediately carried out. The baby accomplishments associated with "Wave tata," "Oh, so big," and so on, are taught to the child by example. We perform the action, and he having it thus impressed on his mind copies it. When the idea has driving force enough, it rushes on to its fulfilment in action.

Baby often chagrins his mother by refusing to show his accomplishments to strangers. Sometimes after persistent urging the act is performed in a perfunctory accidental sort of manner. This is simply because the persistent urging has piled up sufficient nerve force to overflow along the accustomed motor channels. At first the child *could* not perform the act because his attention

was all taken up by the visitor. Sometimes the very strength of a desire may render a child deaf to all directions—even to those which aim at showing him how to obtain the desire.

It is very important for those who wish to treat children justly to realise that they can often do things spontaneously which they cannot do voluntarily. This means that however anxious they are to oblige they often cannot do a thing when requested, which they could easily do if the notion of doing it had sprung up within themselves. This inability is frequently branded as obstinacy.

Automatism.—A child often shows a strong tendency to repeat an action once performed, or to slip automatically from an unwonted line of activity requiring thought to an accustomed one which has become a habit. Thus when certain children are asked to count backward from twenty they proceed thus: "Twenty—nineteen—seventeen—eighteen—nineteen—twenty—twenty-one—" and so on, quite forgetting what they set out to do. This tendency is known as automatism.

One finds the tendency strongly marked in very young children, and more especially in defective children.

The other day I was examining a backward child of ten. I said, "Now I am going to say three figures, and I want you to say them after me. Listen—two, nine, five." "One, two, three, four, five," responded the child.

On another occasion I showed the pictures used by Binet in his tests to a backward boy of eight, and asked him to say what he saw. When he looked at the picture showing the poor people sitting outside in the cold, he said, "I see a man and a wumman, a man and a

wumman, a man and a wumman——" After the twelfth repetition I stopped him, and showed the next picture. This time he said he saw a man. I allowed him this time to repeat his answer twenty-six times, and even then it was I that had to cause the stoppage.

This automatism may also give rise to the accusation of obstinacy. A child begins saying, "I won't," and he may keep on saying, "I won't," just because he has temporarily become a machine which can say nothing else. Slapping is not, I think, a desirable means of education; but on such occasions a sharp slap may be efficacious, just because it pulls the child up, and enables him to regain mastery over himself.

The repetition that one finds in many of the favourite nursery tales is evidently one of the features that renders them favourites.

Every parent must have seen instances of this senseless automatism in his children. Here is an example belonging to Margaret's thirty-first month. The child was having a drink of warm milk; she took a sip, then ran off into a corner, and said, "Did it burn Baby's tongue?" *I.* "I don't know. Did it?" *M.* "N-o-o-o;" then turning to her father who was close by, "I was detting a drink of milk." He, patting her on the back, said, "Well, go and get another." She came back, took another sip, and then went through exactly the same performance. We followed her lead playing our part, and I think the whole was repeated ten or twelve times before we became tired or the milk was finished.

It is easy to see that this tendency to automatic repetition may be at work in the readiness with which children adapt themselves to customs and ceremonies.

Baby originates many of these customs himself and insists on them being carried out. A certain ritual must be observed in putting him to bed, in dressing him, in all the daily routine.

Respect for Law.—It is perhaps partly due to this satisfactiton in repetition that in most children it is not difficult to induce a respect for law, if the law is a consistent one.

Margaret's early social environment consisted of a group of adults who did not like having their property needlessly destroyed. Hence the words "Not for Baby," were words that she heard very frequently during the first eighteen months or so of her life.

We always found that she acquiesced readily in this prohibition if only it were consistently applied; but if she had once been allowed to have a thing, she seemed to think she had thereby acquired a right to it, and she would be far from pleased if it were denied her.

In the twenty-third month I noticed the child apply the law herself. She pulled out a red book from a low book-shelf, a thing she was not allowed to do. She then said "No," very emphatically, and tried to put it back in its place.

These observations go to confirm Sully's conclusion that very early there are forces within the child which act on the side of law and order.

Too often we fail to take advantage of these forces, and insist on an outward conformity when a little foresight and consideration would have given us a conformity springing from within the child.

Every unspoiled baby really likes to be good, but even a baby does not like to be compelled to be good. In

point of fact goodness is not a thing that can be got by compulsion. This is one of the truths that we honour with our lips and dishonour in our practice.

The Self-Sentiment.—Sooner than we think Baby becomes a little person with a sense of his own dignity that can be and often is outraged.

In this developing self-sentiment it is easy to incorporate certain ideals which will exert their effect when the child is not hurried to a decision—a mistake that is often made.

One morning I asked Margaret (fortieth month) if she would like to do some little thing for me. "No," said she point blank; but a moment after came the query, "Am I a 'bliging baby?"

Such ideals are assimilated gradually by the child and should not be over-strained. Nor should the demands made on them be beyond the child's intellectual grasp. It is neither fair nor wise to ask him to make sacrifices for some cause the importance of which he cannot possibly appreciate.

The expansion of the self-sentiment which accompanies the acquisition of any new power is to the child a joyful experience. Very often it is marked by a flow of tender emotion towards the person through whom the expansion has come.

It is said by many that gratitude is not a common emotion in childhood; and it is quite true that children accept the loving care that surrounds them as a matter of course or even demand it as a right.

Yet when such help is given them as enables them to feel their own growth, the emotional state induced is best denoted by the term "gratitude."

Miss Crouch as the result of work with the Montessori material in a London Infants' School says that "a burst of affection invariably follows a new accomplishment." In such circumstances Margaret used constantly to bestow little spontaneous kisses on her instructor.

This loving grateful attitude is the child's natural attitude to the teacher. But it arises only when the instruction satisfies a felt need on the child's part, when he feels that it is producing growth of the self. Naturally it does not arise when, as is too often the case, instruction is thrust upon him which clogs and hinders the self in its struggle towards understanding and mastery.

CHAPTER VIII

REASONING

It might well seem that reasoning, man's proudest faculty, the power that more than any other sets such a gulf between him and the kindly beasts, should belong to the noon-day of mind and not to its dawn.

Yet the chief laws of logic can easily be exemplified in the reasoning of a child before he has attained the age of five.

It is true that this reasoning often leads to conclusions that we know to be absurd; but this is not because the logic is at fault. It is knowledge of facts that is lacking.

In order to explain events the child forms hypotheses very much as we do; these hypotheses are not absurd in themselves, but they often seem absurd to us, because our knowledge of causes is so much more extensive.

Thus a child suggested that his milk was white because the cow was white. The only cow he had seen was white, so this is not a bad hypothesis. Should he now meet with a brown cow and see that it gives white milk, he will spontaneously reject his first hypothesis, thus showing his recognition of the laws of logic.

In inductive logic the child is at a disadvantage, for like all ignorant people he generalises too easily and

does not recognise the importance of looking out for negative instances.

In deductive logic, however, where the premises are given, he is often quite at home, as many a worsted parent has found to his cost.

Preliminary Processes.—Before reasoning is possible there must have been observation, comparison, and judgment.

Without comparison observation is apt to be superficial. We observe just enough for our purposes, and at first we notice likenesses rather than differences. To us all the sheep in a flock are the same, to the shepherd each one is different.

The tendency to group objects in classes, to regard many divers things as the same, is necessary, if we are ever to be able to move familiarly about in the world. If each thing were a thing-in-itself, which had to be experimented with before we knew anything about it, then we should never act freely nor feel at home.

The tiny baby observes to some extent, but for a time all people are the same to him, because he does not observe very accurately. Then as memory develops, differences of holding him and other differences of behaviour begin to attract his attention. Thus people begin to assume individuality. As early as the second month definite comparison may occur in connection with the observation of faces (cf. p. 19).

The effects of these comparisons appear in the increase of the ability to form judgments. When Baby turns away from a stranger and cries, he expresses the judgment that this is not any of the people with whom he is familiar.

I have said above that we observe just enough for our purposes; but in a certain type of mind—possibly in all normal minds—one of the dominant purposes certainly is to introduce coherence and orderliness into the world. Thus we may early see instances of comparison which seem to be made for no other purpose than this.

The beginnings of this scientific comparison may, I think—if we disregard the early examination of faces—be assigned to the end of the first or the beginning of the second year. Several times in the fourteenth month I saw Margaret making comparisons which involved obvious mental effort.

These comparisons took place in connection with the set of Montessori cylinders with which I had presented her (see p. 58). In manipulating the cylinders a child at first proceeds by haphazard; he tries any hole without being guided by the look of the cylinder (method of trial and error). In this way he fills up the larger holes with the smaller cylinders, and then finds it is impossible to get them all in. He makes other attempts, and gradually comes to connect the appearance or the feel of the cylinder with the appearance of the corresponding hole. He is now working not by trial and error, but by means of comparison and judgment.

In many cases this change of method takes place so gradually that one cannot say when the change is made. I have watched children of three and four struggling with great perseverance to put a cylinder of about two inches diameter into a hole of about one inch in diameter. Here comparison had not taken place, and the hole had been selected by chance.

Margaret's comparisons, to which I have referred

above, took the form of deliberate exploration of the cylindrical holes with her hands or with the thinner cylinders. These explorations never lasted more than a minute or two. What made them worthy of note was the expression of intense interest and purpose on the child's face. She was not at the time seeking to put in the cylinders, so that her purpose was just to obtain a better understanding of her world. She was seeking knowledge not for the sake of acting, but simply for the satisfaction she found in knowledge itself.

This kind of theoretical interest is commoner in little children than is generally realised. It ought of course to be sought out and fostered by the educator; unfortunately at present it is often discouraged by our educational systems, as the intelligence of the little child is often seriously underestimated.

The following excellent example of a scientific investigation on the part of a child I take from Miss Loane's book, "The Queen's Poor." "I found a child of four seriously puzzling herself over the cause of bodily heat. She had observed that either thick bed clothes or a fire made her feel warm, and was astounded to find that only the latter affected her doll. She drew the attention of a slightly younger cousin to the mystery, and piled clothing on the doll to prove to the latter that it could not be warmed in that way."

Conception.—The processes of observation and comparison lead to the formation of concepts, or general notions which as occasion arises we apply to the environment. These concepts act as interpreters rendering us able to act with confidence. Thus *something good to eat* is a concept that is formed early; and long before Baby

can talk he may make demonstrations at the sight of biscuit, cake, apple, etc., which show that he judges that here is an occasion when this concept is applicable.

The little child soon forms concepts of such things as chair, bed, table, spoon, plate, book, and other common objects. He takes longer to form concepts of such things as town, island, knight, truth, etc., and longer still to form any adequate concept of such things as party system, sphere of influence, the British Constitution. Indeed much of the time given to education is devoted to helping the child to form such concepts.

In the process of conception error often intrudes. All of us use many terms wrongly because we have never ascertained their exact meaning; we have simply guessed at their meaning from the way we have heard them used. Thus our concept may include qualities which are not necessarily included, and leave out qualities which are essential. Thus a child may think that cathedrals are just very large and magnificent churches.

Another form of error is found in connection with the application of terms. Thus Baby may call every four-legged animal a bow-wow; here the concept is all right, but it is the concept that we denote by the term "quadruped."

Long ago man found out the concepts that were most useful to him, and the products of this early thought are crystallised for us in the form of language. Thus in teaching the child language we are helping his progress along the path of conceptual thought.

Language not Necessary to Thought.—Language undoubtedly helps thought, yet much thought is possible

apart from speech, and many concepts are formed before speech begins at all.

In purposive thought or reasoning we apply concepts already formed in such a way as to get a new result. The little child reasons when in order to get something beyond his reach he brings a stool or chair to stand on.

Much of the child's early reasoning is expressed in this way by his actions.

Here is an example of such reasoning that I owe to Miss Crouch of the New End L.C.C. Infants' School:—

"George, who was four and a half years old, was asked to fetch a jug from the sitting-room. It was necessary to cross the hall, go through the communication door and up two flights of stairs, then round a dark corner to enter the room. There he found the cupboard door locked. He searched in another cupboard and found a key which he tried in the lock, found it fitted, took the jug, relocked the cupboard, replaced the key where he had found it, brought the jug downstairs, and explained why he had been such a long time (about ten minutes)."

Definitions.—By expressing our concepts in words we bring forward aspects of them which seem important to us at the time, and by this analysis we also make them clearer to ourselves.

When a concept has been clearly formed and is exactly expressed in language we have the logical definition.

The logical definition first assigns the concept in question to some larger class, and then adds a difference which distinguishes it from all other members of this larger class.

Thus a triangle may be defined as a plane figure enclosed by three straight lines.

Here we first assign triangle to the large class of plane figures, and then we limit it by stating the exact number of sides.

Such a definition is adequate to the concept, because it includes all members of the class triangle and no members of any other class.

Such definitions are obviously very difficult to frame. It is generally easy to find a suitable larger class or *genus* as it is called, but it is very hard to get a satisfactory distinguishing difference. Thus if we were defining horse, we could assign horse to the larger class of quadrupeds, but without an extensive knowledge of biology we should find it hard to add a difference which would distinguish it from all other quadrupeds.

Progress in science consists largely in progress towards adequate definitions.

We cannot, then, expect a child's definitions to be adequate.

As a matter of fact they are not usually adequate even to his own concepts, for one can seldom get him into a frame of mind in which he wishes to give a scientific definition.

Binet uses definitions as one of the tests in his scale of intelligence. He finds that young school children commonly define a thing by mentioning its use, while other children (from nine years of age) give descriptive definitions approximating more nearly to the correct logical form.

Thus a five-year-old boy gave the following definitions: —

Fork—you lift things up with it.

Table—you put your dinner on a plate and you put it on the table.

Chair—a chair's for sitting on.

Horse—you ride on a horse.

Mother—a lady. (Anything else?) A lady that makes dinner.

These definitions are all of the "use" type except the last, which is of the higher type.

This change in the type of definition may indicate an advance in the form of thought. On the other hand, it may take place because the older child has had more practice in school in forming definitions of the approved type.

Mr. Boyd, in a series of tests put to his little girl, found that at three years of age she gave definitions of the logical type, whereas at five she gave them of the "use" type. Definitions given in the course of ordinary conversation, not under the artificial conditions of a test, were still mainly of the logical type.

As the result of his investigations Mr. Boyd believes that the logical type is the type spontaneously adopted by children from the first, but that during a certain period —roughly from five to nine years of age—the use type is adopted, especially when the terms to be defined are very familiar. The reason why there may be a drop from a higher to a lower type of definition is largely just because the thought of a child of five is so much more consecutive than that of a child of three that it is more rudely disturbed when broken in upon by a demand for disjointed definitions; and so the child just gives the first property he thinks of belonging to the thing, and that is usually its use.[1]

Continuous observation of individual children with

[1] For Mr. Boyd's paper, see "Child Study," May, 1914.

respect to this point is desirable. There is probably considerable individual difference. Thus the first satisfactory definitions obtained by Bateman from his child were mainly of the use type (thirty-seventh month).[1]

It was not easy for me to obtain evidence from Margaret. When I first asked her for definitions, she was either unwilling to answer or would not treat the matter seriously. Thus in the thirty-fourth month her definition of feet, given with a very roguish expression, was "Bite 'em in my mouf. I can put my feet in my mouf now. In my baf you can see me." A few days later I put the question, "What is a hat?" Both her mother and I thought from her expression that the child perceived something of the difficulty of saying what a hat *is*. Had I said, "What is a hat for?" there would not, I think, have been any hesitation. After a few seconds' thought she countered with the question, "What is a ball?" (term suggested by play going on close by). It took considerable persuasion to obtain from her the answer, "To put on," a use definition.

Rather more than a year later (fiftieth month) I hit upon a device which put her into a more serious mood as regards definitions. I found that the definitions thus obtained belonged to the logical type; *e.g.* "A school is a place where children go to do lessons," "A tree is a thing with leaves," "A motor is a thing with wheels that goes very quickly," "A horse is a thing with head and legs and a back." To the question, "Am I a horse, then?" she replied, "No, a horse goes on four legs."

On the whole I incline to agree with Mr. Boyd, that when the child is seriously trying to give a definition he

[1] *Journal of Educational Psychology*, October, 1915.

seeks the logical type. Mr. Bateman's results seem not to accord with this conclusion, but from his statements I think he often put his questions in such a way as to suggest a use answer to the child.

Deductive Reasoning expressed in Language.—The child's reasoning power as shown in his activities and also in his language develops surprisingly early.

In the twenty-seventh month Margaret's power of logical thought seemed to me much more on a level with ours than was her power of manipulating things. Thus she failed in this month to separate two hairpins hooked together; her only idea was to pull. She failed in an attempt to put a brush into a bag, though she managed a comb. Yet she could argue very well, as this example shows. She wanted one morning to tie my ribbon for me. I said it was too high for her. She patted the bed where she was sitting and said, "Ahtie teet lay, Baby tie" (if auntie will sit there, then Baby can tie).

In the thirty-ninth month Margaret worked out an excellent hypothetical syllogism. The question was, should we go a picnic? We were induced to say that if it was fine we would go. She then declared, "If the sun is shining, it is fine," and very meaningly added, "But the sun is shining."

In the same month I tried in vain to lead the child astray from the path of logical rectitude. The argument took place with the Baba, the little doll that often shared her bath. Margaret was splashing water on the Baba.

Baba. "Is that rain, Baby?" *M.* "No, it's not

rain; it's just me." *B.* "But it's water, isn't it?" *M.* "Yes, but it's not rain." *B.* "But rain is water, isn't it?" *M.* "Yes, but all water isn't rain." The learned will note that the child here refused to be led into the fallacy of supposing that an *A* proposition can be converted simply. The Baba like many stupid people was not convinced by her opponent's excellent logic, and went over the argument again. This time Margaret sought to make her see reason by declaring, "It's just water; it isn't rain water."

Here is another rather neat piece of reasoning belonging to the forty-seventh month. Two little girls, Isobel and Helen, were to come to tea. I said they would perhaps not come, as it was wet. *M.* "Oh, but Isobel has an underbrella, under—um—what is it?" Later I said, "Perhaps Helen has an umbrella too." *M.* "No, she hasn't. Anyway, she didn't bring it last time, and it was raining."

The child's mastery of the essentials of logic is to me still in extraordinary contrast with some of her other powers. For example, she does not seem in the least to know how to turn a button-hook in order to button a button; she just moves it at random. Also she shows very little notion of how to fit the pieces together in a very simple picture puzzle.

Inductive Reasoning.—It has already been admitted that children do not shine in inductive reasoning, because of their sparse knowledge of relationships.

Yet the methods they spontaneously employ are the methods which every man of science employs.

At a very early age Baby begins to try experiments. He thus finds out that all things fall to the ground when

unsupported; that spoons make noises of various kinds according as you bang them against the table, a plate, or a glass; that coal blackens your hands if you touch it; and many other interesting facts.

In her fifteenth month Margaret put her mouth down to one after another of the holes for the Montessori cylinders, and with evident interest tried the effect of making noises into them.

Such experiments result merely from a general interest in the surroundings. But very soon definite hypotheses as to causes are formed, and then experiments are devised to test these hypotheses.

This is of course *the* method of science.

In the fortieth month Margaret was interested in a spot of sunlight on the wall. By putting herself in the path of the sunbeams and so blotting out the spot, she demonstrated to her satisfaction that it was produced by the sun.

In her thirty-eighth month she observed with astonishment water pouring down the window of a fish shop. She was inside the shop at the time. She rushed out, applied her hand to the glass, came in again and observed the phenomenon again, then went outside and repeated her experiment. Here apparently her hypothesis was that the water was outside as is usual; but being uncertain, possibly because she knew it was not raining, she proceeded to test her hypothesis by experiment, and was obliged to reject it.

Method of Analogy.—The method of analogy is another method that is largely used by the child. Here he often goes astray, because the resemblances he fixes on are superficial, and have no real bearing on the

matter; as when a child of five thought men were filled with sawdust after the manner of dolls.

Yet the method is sound, and often the argument is good.

Here is an example belonging to Margaret's forty-seventh month which may perhaps be brought under the head of analogy. She had brought me a cylindrical brick telling me it was a nice dollie for me. "Oh," I said, "a round dollie." She must have thought I was finding fault with its roundness, for she at once pushed out her little body, and stroking herself round the chest, said, "You see I'm round," then picking up a real dollie, she added, "This is round. Why shouldn't the other dollie be round?"

Concrete Illustrations.—Concrete illustrations are often of great value in testing generalisations. Here the child's mind is often extremely fertile.

As an example I will use another argument of Margaret's also belonging to the forty-seventh month. One day she was playing shop with her bricks, and she bought a "big bed for a little girl." I pointed out that there were no sides, so the little girl might roll out. *M.* "Do you 'member me at Dumfries? Well, I had a big bed without sides and I didn't roll out."

False Theories.—Faulty generalisations and untenable hypotheses are of course common with children just as they are with adults. They are so common that it is scarcely necessary to illustrate them. It is sometimes easy to perceive their source; at other times difficult or impossible.

There are two false theories held by Margaret which

have considerable interest, because many children hold them. One is that if you hide your face, you thereby conceal yourself from view. The other is that in course of time grown-up people become little again.

Both theories have, so far as I can tell, been evolved spontaneously, not by means of any suggestion.

The first is shared by the ostrich, and of course we can see a grain of reason in it.

The second theory is sometimes extended so as to include things. I am inclined to believe that Margaret does so extend it. Sully gives a number of instances from different sources showing that the theory is a common one.

How are we to account for its formation?

Miss Shinn ingeniously suggests that it may date from a time before the child has learned to see properly, a time when things appear to be constantly changing in size. In this case it is a reminiscence of babyhood.

This explanation does not seem to me quite to fit the facts of the case. According to the child's theory people do not change in size at random, but according to a definite plan; old people, or rather big people become little, while little people become big.

We may, I think, find the grounds for the theory in the child's own growth. As he grows, other people and things actually do become less to him; the shrinkage is going on before his eyes, and he has only to suppose it to continue, to develop the notion that when he is grown-up the present grown-up people will be babies.

I remember going, at the mature age of fourteen, to see an old lady whom I had not seen for some years, and I vividly remember the difficulty I had in believing that

she had not shrunk to an extraordinary extent in the interval.

Another false theory founded on a considerable amount of observation, is that to obtain money you have only to go to a shop and buy something, and then "the woman will give you LOTS of pennies."

Educational Application.—If the contention of this chapter is sound, namely, that the reasoning power of the child may be appealed to with confidence in the first few years of life, it surely forms a strong plea for the education of little ones between the ages of three and five.

I have recently been in close association with Margaret (fiftieth month) for two or three weeks. The word most constantly on her lips is "Why?" Some of the "Whys" are sensible, some are silly; but the very fact that she is now using this particular word as a sort of universal key to unlock the secrets of the universe, shows that she is feeling after causal connections, and indicates her need of help in her endeavour to understand the relationships of things.

Not till five do the majority of our children go to school. Even then we call them "Infants," and many of us imagine there is little of importance they can learn for a couple of years yet.

I do not deny that in very favourable home conditions it may sometimes be well for a particular child not to begin his formal education till the age of seven or eight. But disregarding such exceptional cases it seems to me we may well raise the question whether the present school age is not too late rather than too early.

May it not be that at the age of five many a child

has lost the fresh spirit of inquiry which was his at the age of three or four? Even then shades of the prison house are closing in; his wits are being blunted by custom; wonder is oozing from the world. Moreover he is quick to perceive that his questions bore the adults around him, or, even worse, amuse them; and either attitude is fatal to his natural progress.

It seems to me very probable that were our little ones gathered in small groups under the care of one who would mother them mentally as well as physically—and the former is the harder task—it might mean an enormous uplift for the race.

CHAPTER IX

LANGUAGE: SPOKEN AND WRITTEN

LANGUAGE is a means of communication and an instrument of thought.

It is also the tool which enables us actively to lay hold of the knowledge and culture of mankind.

If we examine our mental possessions we shall find that we have acquired only a small proportion of them by our own observation and direct experience. We owe a large proportion to the spoken word of others, and a still larger proportion to the written word, as we have found it in books and newspapers. The invention of written language has made it possible for all learning to be stored up in a vast reservoir to which any one may resort. It might indeed with some plausibility be argued that the only teaching a child needs is to be taught to read. This one power renders all others attainable.

Language as a Means of Communication.— If strictly used, the term language would apply only to oral speech. But it is generally extended so as to include any means of communication. Any arranged system of signs may be a language. Thus we talk of a language of flowers, a language of stamps, the finger language of deaf mutes, written and printed language. There is also the language of natural gesture which is

readily understood without any pre-arrangement. It is a universal language, but it is insufficient for the needs of a being of complex mental life.

The impulse to communicate with others is deep-seated in man. The practical value of such communication is obvious enough, for it is often only by the help of others that we can gratify our desires. But the impulse to communicate does not arise only out of our material needs. It is closely bound up with our craving for sympathy, our need that others should share with us our experiences.

Helen Keller gives a striking description of the force which this impulse to communicate attains when by any means it is pent up. She is writing of the time before her teacher came to her, a time when her deafness and blindness cut her off from all but the most meagre intercourse with her friends.

"Meanwhile," she says, "the desire to express myself grew. The few signs I used became less and less adequate, and my failures to make myself understood were invariably followed by outbursts of passion. I felt as if invisible hands were holding me, and I made frantic efforts to free myself. I struggled—not that struggling helped matters, but the spirit of resistance was strong within me; I generally broke down in tears and physical exhaustion. If my mother happened to be near I crept into her arms, too miserable even to remember the cause of the tempest. After a while the need of some means of communication became so urgent that these outbursts occurred daily, sometimes hourly."

Language as an Instrument of Thought.—Language presents us with a ready-made analysis of

what is given in perception. In learning language we at the same time assimilate the thought that has gone to its making.

What is given in perception comes to us all of a piece; but language, by directing attention now to this point, now to that, breaks up the "given" into "things."

Names are given to these things, and they confer upon them a unity and individuality that was not their's before. Thus the given is analysed.

An even more important consequence of the giving of a name is that by its agency we are pushed on from the particular to the universal. Only a small class of names, the so-called Proper Names, are chained down to individuals. By far the larger number of them are applied to many individuals, and are thus a standing challenge to our intellect to discover the common qualities in virtue of which the name is applied.

Thought could not go far if it were limited to particulars. Under the fleeting particulars it seeks out the universal, and it marks the permanence and stability of the universal by means of the permanence and stability of the name. Thus the word "cat" is not limited to my cat or your cat, to the cat of to-day or the cat of to-morrow; it includes all creatures possessing those qualities in virtue of which we are ready to bestow the name "cat."

This property of language has far-reaching consequences on the education of the child.

While one function of language is in this way to break up the environment into manageable pieces, another function is to put it together again. Synthesis is no whit less necessary than analysis. Every judgment involves both these processes.

Thus if I say to you, "My cat is black," you have to take the notions of cat and of blackness derived from previous analysis, and put them together so as to form a new idea, thus performing an act of synthesis.

The word-symbols of which language consists are easily carried in our memories and can be produced at any time. By their means we are to some extent released from the bonds of time and space, and enabled to enter upon eternity.

Acquisition of Language by the Child.—In considering the acquisition of language by the child two processes have to be kept in view, first, understanding, and second, learning to speak.

When we learn a foreign language we have to take into account both these processes. But the work done by the child in learning his mother tongue is a much more fundamental work than ours in learning a foreign language.

When we learn French or German, for example, we are acquainted with the system of thought of which the language is the framework. We already have the ideas: we are learning new terms only. But the child has to acquire the ideas as well as the terms.

Stages in the Acquisition of Language.—Sound-Play.—During the first few months the Baby practises his vocal organs assiduously, making a great variety of sounds. Many of these sounds can be represented by letters of our alphabet; others defy any attempt so to represent them. Some of the sounds accompany and become indicative of certain states of body or mind, such as comfort, hunger, pain; others seem to be just a form of play.

Vowel sounds naturally occur first, and a large variety of these may be distinguished in the early cries. Then consonants begin. Of these the labials, b, p, m, generally come early; but individual differences are great. Gutturals, for example, are very late in some children, but may appear quite soon. They were common in Margaret's early prattle.

Many children get hold of one sound, and practise it almost exclusively for some days, and then pass to something else; thus the "talk" may consist at one time mainly of ba ba, a few days later of uv uv, or of za za. At one time Margaret was known as little Zaza, so constant was this sound in her cry.

The sounds l, r, and s do not generally appear till rather late. We know that many children, who can otherwise talk distinctly, fail with these letters, saying, for example, wound for round, or schoo' for school.

Yet a child who has such defects in his later speech may have made the required sounds quite correctly in his baby prattle. Thus Margaret used regularly to say Somer*w*ill for Somer*v*ille, yet u*v*, giving the v, was a sound she practised diligently in her first half year. Also in her fourth year she would say welly for very, yet in her sixteenth month she evolved the sound b*r*m, and burred the *r* with great delight.

This baby "talk" often sounds quite like real talk, there being a great range of inflection and modulation in the child's voice. Doubtless Baby thinks in a vague way that he is talking just like other people. When he is happy or excited, his talk flows freely. In the seventh month Margaret often had a ride on her father's shoulder after tea, and this was a time for jubilant eloquence.

First Stage in Understanding.—In the correlative process of understanding the first stage is probably the association of a particular sound with a particular act, the obeying of a command, as we sometimes put it. Thus "Wave tata," "Kiss handie," "Salute," are examples of sounds, which are soon associated with appropriate responses on baby's part. In the tenth month Margaret undoubtedly "understood" in this way "clap handies," "oh so big," "not in mouth."

By the fifty-second week Axel had learned to give his hand when requested. After this it was easy to teach him to raise both arms whenever he heard "Wie gross?" (How tall?) and to give his ring at the words, "Where is the ring?" followed by "Give."

Once the first association of this kind has been made progress is surprisingly rapid. "The ability to learn, or the capability of being trained," says Preyer, "has emerged almost as if it had come in a night."

We must, however, beware of thinking that such responses necessarily imply understanding of words. They are mere associations of *sounds* with acts.

Yet when the same sound is constantly used in different settings, as *give* in "give the hand, give the ring," that sound comes to be distinguished separately, and associated with what is common to all the acts, in this case the act of giving; and in this way a real understanding of words begins.

Second Stage in Speaking.—Definite imitation of sounds may probably be set down as the second stage in speaking.

Children differ very much in the facility with which they imitate sounds. The power to utter a sound

spontaneously, as in the early "talk," does not bring with it the power to utter it voluntarily, *e.g.* in imitation of any one else. Axel in the tenth month could not say after any one even the primitive syllables of his own babble, *e.g.*, *da*, although he made "manifest by his effort—a regular strain—by his attention, and his unsuccessful attempts, that he would like to say them."

In the eleventh month, on the three hundred and twenty-ninth day, appeared in Axel's case the first unquestionable sound imitation. "In general, it often happens, when something is said for imitation, and the child observes attentively my lips, that evident attempts are made at imitation; but for the most part something different makes its appearance, or else a silent movement of the lips" (Preyer).

This keen scrutiny on the part of the child of the speaker's lips ought to be noted. It is a very characteristic way of helping his acquisition of the power of speech. Those who are about the child ought to lend their aid. They should often speak to Baby, even before he is ten months old, slowly and distinctly, looking full at him, so that he may see clearly the movement of the lips.

Babies born deaf babble like hearing children. Their deafness is often not discovered till they are about two years old. If they were given special opportunities to acquire the power of lip reading, and encouraged in babyhood to imitate the movements required for speech, it is quite possible, even probable, that they would at this stage learn to speak more easily and more naturally than at the age of six or seven when tuition in such cases is usually begun.

The indistinct speech of children must be largely laid to the account of the slovenly speech habits of the adults around them.

In her fifteenth month I noticed that Margaret was very reluctant to imitate sounds, and was not very successful in the attempts she did make. At this time she readily imitated simple movements.

In the sixteenth month when asked to say *daffodils*, she succeeded in uttering a very explosive *da*; when asked to say *ducky daidles* she made a courageous attempt, moving her tongue to and fro and getting a curious liquid sound.

Some children develop a strong tendency to imitate speech sounds, and may for a time become regular little echos. In this "parrot" way quite long rhymes are often learned.

Even when children can talk quite freely, they should be carefully *taught* new words. The words should be divided into syllables and pronounced slowly, the child if necessary being allowed to repeat each syllable separately. Many adults encourage children in their mispronunciations simply because they find such massacring of the King's English amusing. This should not be done.

In the thirty-fourth month Margaret, then a very distinct speaker, was found to be pronouncing *banana* as *piano*. It needed several deliberate repetitions of the word before she caught the sound correctly.

A very common form of mispronunciation is to reverse the order of the letters. Thus Peggie would say "pilse" for spill, and even when she was nearly four years of age she said "Parkincane" for Canaan Park. Similarly

for a long time Margaret said "fess" for self. In her thirty-ninth month once when she had been sitting quiet, she was asked by her nurse what she was thinking of. "I am a big girl now, Nana," she replied, "I am not going to say *fess* any more. I can say *self*."

Hitherto I have been considering imitation which is deliberate, intentional. But it is obvious that by far the greater part of the child's words are obtained by an imitation which is unintentional, spontaneous. He picks up words from those around him, when they have no idea they are teaching him. Some of these imitations are faulty, for Baby has difficulty with certain letters; that becomes *tat*; there, *'ere*; get, *det*; and so on. But he soon gains an intelligible vocabulary—intelligible at least to those who are constantly with him—sufficient for his simple needs.

It is by this unconscious imitation that the child acquires accent, inflection, intonation. Hence it is important not only that those around him should speak clearly and distinctly, but that they should have pleasant, well-modulated, cultivated voices.

Second Stage in Understanding.—From mere association of certain definite sounds with certain responses the child by hardly perceptible gradations passes to the real understanding of words.

In some children understanding advances far mere rapidly than the power of speaking; in others the reverse is the case. Possibly this difference may correspond to the distinction between the sensory and the motor child.

Early in the second year or late in the first, progress in understanding is very rapid and one is constantly

astonished by evidence that Baby has picked up the meaning of words on which no special emphasis has been laid.

At first understanding is merely on the perceptual plane. Names are associated with things just as they are associated with people. One says, "Where is the sponge?" and Baby looks round for the sponge or goes to fetch it. Yet he may not yet have formed any concept of a sponge. The sound *sponge* is just the label which indicates his own sponge.

A clinging to the perceptual plane is perhaps shown by the child's belief that all things have their own individual names. (Cf. p. 112.)

Third Stage in Understanding.—The third stage in understanding has been reached when the child grasps the fact that the word stands for a concept. It ceases to be a mere label denoting a particular thing, and begins to have a *meaning* in its own right. *Words* increase in importance; *things* sink to an almost subordinate position.

It is only in thought that we can separate these two stages. In practice Baby's pause on the perceptual plane is so brief that we can scarce say he is there, before he has gone.

He is helped in his progress by his quick perception of resemblances. His observation is very superficial, so that likenesses which are obscured for us by the many differences are apparent to his eyes.

Again, he knows few word sounds, and is eager to use them. In his speech muscles the trigger is always set, and the slightest thing brings about the word explosion.

Thus he associates the term *dada* with his father.

Any man has a certain superficial resemblance to his father, and this resemblance may start the train of nervous activity which results in the exclamation *dada*.

Baby is corrected. He learns "That is another man; not dada." Thus he comes to limit the term *dada* to his father, while at the same time he gains a glimmering of the *meaning* of the term "man." Thus by his own stumbling attempts to make use of verbal sounds and by the social corrections which attend these he is pushed along the path of conceptual thought.

Third Stage in Speaking.—We may consider that the child has reached the third stage in speaking when he possesses a vocabulary which he can use freely in such a way as to make his meaning plain to others.

This stage is reached very early, and as every one knows Baby can do wonders in the way of making his wants known, when he has command of very few words. Thus *Down* may mean: Set me down; The spoon has fallen down; Don't hold the ball so high above my reach, and various other things all easily intelligible at the moment.

The child has now practically attained the command of language; and all that remains is that he should increase his vocabulary, and gain a more exact understanding of the meaning of the terms he employs.

Duplications.—It is consonant with the child's general habits that he should tend to duplicate the sounds he uses. One notices these duplications in the early babble; and it is natural that one should find them in baby language all the world over. *Mama, papa, gee gee*, are real baby words. I expect every baby makes

original contributions to the stock of such words. Bubu (book) and wawa (water) were Margaret's.

Onomatopoetic Words. — Words derived from sounds, such as bow wow, puff puff, quack quack, are also congenial to Baby, and these are often also supplied by himself. Thus at seventeen months Walter used his "first real word," *Tann, tann, tann,* when he heard the clock strike. This he always repeated afterwards on similar occasions.

Original Words.—Many little children have a good stock of words which they seem to have invented themselves. Sometimes these words are imperfect copies derived from the speech of those around them; but often it is hard to tell their derivation.

J. J. Bell has an amusing story of a little boy who had so many of these words that, when sleepy and likely to be fretful, he could be left by his devoted parents to the care of another only after a little dictionary of these terms had been prepared.

Margaret had three such words *memy* (flower), *oo* (pencil), and *mè* (more). Memy was derived from smell; it is still retained in her vocabulary, but has acquired a different meaning. Oo was possibly derived from a long drawn out Oh-h, commonly said by the nurse when the child exhibited one of her drawings. It was used with great frequency in the end of her second and the beginning of the third year. In the fourth year it had almost dropped out of use, but might be heard occasionally. Mè was probably derived from milk; it was used as a request for more food for a month or so, but soon dropped out of the vocabulary altogether.

Extensions of Meaning.—When a baby learns a new word he generally learns it in connection with some complex experience, and he may easily attach the word to the wrong element in the experience. Even if the element is correctly discriminated, the word is associated with the whole experience, and may readily be brought up if any element recurs. Thus a little boy learned the word *quack* one day when he saw ducks swimming on a pond. He subsequently applied the term to the water of the pond, then to liquids in general, then to birds in general.

By her sixteenth month Margaret had learned to say "Dada" in response to the question "Who are the letters for?" One day she hailed a red pillar-box as Dada. The term was not used by the child to denote her father. It was simply associated in a general way with the coming of the postman and letters. Hence the exclamation indicated the knowledge of the fact that the pillar-box too had something to do with letters.

The example serves well to show the way in which extensions of meaning take place. Such extensions may be either encouraged or discouraged. In Margaret's case they were few in number, partly, I think, because they were not adopted by those about her.

Extension of meaning is also brought about by resemblance (cf. p. 131), and this is often a legitimate extension which helps the formation of the concept.

At other times the resemblance is superficial, and we may obtain in the child's matter of fact attempt to extend the meaning of the term what to the adult has the flavour of a figure of speech. Thus the other day (fiftieth month)

Margaret, looking at a strawberry, said of the husk, "Is that its little petticoat?"

Formation of New Terms on the Model of Old Ones.—Many children show great ingenuity in forming new terms after the pattern of those they already know.

Past tenses are readily formed by adding *d*. Thus we get gived for gave, runned for ran. We may even find such a curious form as thoughted.

The use of the negative particle is realised. Thus "unpush me" (thirty-sixth month) was Margaret's way of indicating her desire that her chair should be pushed back from table. Similarly in the fiftieth month "unkey" was used in default of the term "unlock."

Sentences.—As we have seen, the first words that Baby uses are equivalent to sentences, though in form they are single words. Very soon words are coupled together, perhaps on the child's own initiative, perhaps more usually in imitation of phrases used by others.

At two years of age Margaret used only about twenty words; they were employed either as name-words or wish-words, and included the eminently useful vocable *No*. She used also four phrases, *wee baby*, *dood baby*, *'appy baby*, and *vay vay tata*.

A month later she was forming neat little sentences descriptive of what was going on; *Onkel lee* (uncle is reading), *Fave' pu' baby lay* (Father is pulling baby's hair). *Mam ca'y memies* (That man is carrying flowers).

About this time her activities were accompanied by a ceaseless chatter in which the same words and phrases

were repeated again and again. Her pronunciation was not good, and her attempts at deliberate imitation of sounds were distinctly bad and difficult to obtain. On the other hand, her enunciation was clear and distinct.

A sudden burst into speech is characteristic of many children. It was in the twenty-first month that Walter found his tongue. His mother says: "It was amazing. By the end of the month he could say any of the ordinary household words, and could almost repeat many rhymes being given the first word of each line."

Axel combined two words to form a sentence first in his twenty-fourth month: *haim, mimi* (I would like to go home and drink milk). In the following month his father notes his progress as extraordinary.

The first attempt to narrate a personal experience is noteworthy. In Axel's case this occurred in the twenty-fifth month: "Mimi atta teppa papa oï" (Milk gone [on] carpet; papa [said] "Fie!") Margaret's little sentences belonging to the twenty-sixth month are parallel instances. A further advance seems to me to be made when the incident described belongs to the past. In the same month Margaret told her Mother with great earnestness, "Baby fa' pa'," referring to a fall on the path she had had an hour or two earlier.

The first formation of clauses is also worthy of remark. Axel began to do this in the thirty-second month. "Weiss nicht wo es it" (Don't know where it is). I probably missed this event in Margaret's case, as I was not with her at the time when the first attempt might be expected. In the twenty-seventh month she gave what was in effect a complex sentence. "Baby have tat bubu a *wee* baby" (Baby [herself] had that

book when she was a wee baby). Other connected clauses were given in the same month. For example, one day she was not allowed to walk because the streets were wet; noticing a dry piece of pavement she pointed to it, saying, "Tat dy; Baby walk lay" (there). (Cf. also p. 136.) The next example I have noted belongs to the thirtieth month. At this time the child was in Edinburgh and, as it happened, often heard soldiers' bugles in the morning. One day she informed me "Soldier men made funny noises *while* Baby was lying there;" here she stooped and poked her pillow vigorously with her finger.

The first question should also be carefully looked for. This also I think I missed. In the twenty-ninth month Margaret's questions were plentiful. Axel asked his first question in the twenty-eighth month. "Where?" was then his only interrogative word. "Why?" did not appear until the thirty-fourth month. "When?" was not used till the close of the third year.

Inversions and Wrong Words.—Just as when we are learning a foreign language we often use wrong words or put the right ones in the wrong order, so does the child when he is learning his mother tongue. In the thirty-third month Axel confounded "too much" with "too little," "to-day" with "yesterday," "never" with "always." "Did mother put too *less* sugar in your tea?" inquired Margaret (thirty-fifth month). "How much does it *pay*?" (cost) is a question belonging to the same time.

Inversions of order were fairly common but I found it difficult to retain them exactly in my memory.

Pronouns.—The early use of the pronouns is

obviously a matter of great interest. When Baby ceases to talk of himself in the third person and begins to use the pronoun I, he is certainly attaining to a clearer realisation of himself. Some children confound "I" and "you." This is natural as Mother speaks of herself as "I," while she refers to Baby as "you." Very often, however, adults when talking to Baby use the third person exclusively just as he does. Probably this practice does make things easier for him, but it may delay his appropriation of the terms "I" and "me." I am inclined to think that Margaret would have used the first personal pronoun almost as soon as she began to speak but for the bad example set her. In the twenty-sixth month she usually referred to herself as Baby, but when one popped her into her "pram," with the words "In you go," she would respond quite correctly "In I go."

The third personal pronoun is also important because a correct use of it indicates the distinction of gender. Margaret began to inquire into these mysteries in her twenty-ninth month. She then uniformly used "her" in place of "his." She was told one day that father was "he." Conversations such as this took place:

"Faver he?" "Yes." "Nana he?" "No, Nana she." "Lalla he?" "No, Lalla she." "Mamma he?" "No, Mamma she," and so on.

The importance of relative and interrogative pronouns will have been already realised in connection with what has been said about clauses and questions.

Pedantry.—In the realm of language, as elsewhere, the child frequently shows himself a stickler for

accuracy. It is natural that when he finds himself so often corrected he should upon occasion himself like to assume the function of mentor. Once in her fortieth month Margaret, looking at a picture of a pair of shears, called them scissors. Her father said, "These are big shears when they are used in the garden." "And what are they," the child inquired, "when they are not used in the garden?" This, of course, may have been genuine desire for information, but such corrections of the often careless speech of grown-up people are not uncommon.

Size of Vocabulary. — The size of a child's vocabulary probably corresponds to a considerable extent with his range of experience. So far as intelligence is concerned quantity is of less account than quality.

It is obvious that the individual ability of the child, his special interests, and his environment will all affect his vocabulary. Of these factors Dr. Drever, after procuring and carefully analysing various juvenile vocabularies, concludes that the environment will be mainly reflected in the nouns, the child's interests in the verbs, and his mental grip in the pronouns, adverbs, prepositions and conjunctions. In particular, the first personal pronoun, the adverb of degree and the subordinating conjunction are each marks of definite stages in mental development.

A number of attempts have been made to obtain complete vocabularies of young children. The method pursued is to note down every word used by the child for a certain period—say ten days. During this period the child should be stimulated by means of walks, pictures, etc., to use all the words he knows.

The following table gives a few of the results that have been obtained by various observers :—

Parts of speech.	Jane (1) 12 months.	Jane (1) 28 months.	H (2) 28 months.	Margaret (3) 31 months.	H (2) 34 months.	Jane (1) 36 months.	D (2) 43 months.	J (2) 54½ months.
Nouns (common) .	5	205	172	385	577	399	449	1012
„ (proper) . .	not noted	not noted	4	not noted	14	not noted	13	56
Verbs	2	95	80	151	148	164	162	290
Adjectives. . . .	2	47	44	77	89	75	102	205
Pronouns	0	12	11	24	23	21	28	33
Adverbs	0	31	17	62		52	36	56
Prepositions . . .	0	5	8	18		13	16	27
Conjunctions . . .	0	0	2	2	43	2	8	16
Interjections . . .	1	10	—	—		12	—	—
Unclassified . . .	0	0	7	7		0	10	17
Total	10	405	345	726	694	738	824	1712

[1] "Two Children's Progress in Speech." W. G. Bateman: *Journal of Educational Psychology*, October, 1915.

[2] "A Study of Children's Vocabularies." James Drever: *Journal of Experimental Pedagogy*, Mar., June, Dec., 1915.

[3] "Notes on Speech Development." Margaret Drummond: *Child Study*, Oct., Nov., 1916.

These figures give some idea of the extent of the vocabularies of little children when the environment is a favourable one. Reference should be made to the original papers, where the detailed vocabularies may be found.

Gesture Language.—Some children, before they are able to talk, show their understanding of what is said to them and make their own meanings known by means of a variety of gesture. This at least was noticeable in Margaret's case, perhaps because her ability to

pronounce sounds lagged far behind her intelligence. Thus in her twenty-second month when the word "brush" was mentioned in her hearing, she at once rubbed her head. When she was asked if she remembered some person she went through a little pantomime descriptive of that person's customary activities. One day in her house in Manchester I asked her, "Will Baby come to Edinburgh with Auntie?" She at once patted her own head to say she would go and put on her hat. She then patted my head and body to tell me to make ready. Next she took hold of her mother's hand and pulled it to show that she must come too.

Drawing.—Drawing in the case of little children is not so much an art as a kind of language. The drawings are symbolic rather than realistic. When a child draws a house, showing not only the windows and doors and the finely smoking chimneys, but the tables and chairs inside the rooms, he does not mean to say that these things can really be seen through the walls; he simply means to tell you they are, as a matter of fact, there.

The forms from which the letters of our Alphabet are derived originally stood for things. Now the forms have been stereotyped, and all association with the things for which they once stood has been dropped. We find here another reason for regarding children's drawings as a kind of written language, for in them forms tend to become conventionalised in the same way.

Again, after children have learned to print they frequently label different features in their drawings, showing that they are concerned with meaning rather than with representation.

In this connection I may mention an interesting piece of evidence of the prevalence of what I have called the "self-projection" type of imagination in children. Some children made for me drawings descriptive of a poem in which a poor child is represented as looking longingly into a garden in which many rich children are playing. In two of these drawings a name-plate was carefully portrayed on the garden gate, and on these plates were printed in each case the surname of the little artist.

The symbolic character of children's drawings appears also in the way in which qualities are indicated. Thus a general will be made much taller than any of his men.

Some children were once illustrating for me Stanley's Travels in Africa. On looking at one representation of a caravan journey, I said, "But, Amy, could you not show the difference between the white men and the black men?" "Oh, but I have," returned Amy. "The black men have no bodies." On looking more closely I saw this was indeed so. The black men's legs came straight out of the little circles that stood for their heads.

A considerable amount of work has been done on children's spontaneous drawings, and all parents and teachers should make themselves acquainted with the papers on the subject in Sully's *Studies of Childhood*, and Earl Barnes's *Studies in Education*.

It is not always realised what a valuable instrument for gauging the contents of children's minds we have in this willingness to draw.

I have a set of illustrations of Longfellow's *Slave's Dream* done by children from ten to twelve years of

age. In several of these drawings the "ungathered" rice is portrayed as a great number of little oval bodies scattered over the ground, showing that the children's acquaintance with rice is limited to their mothers' kitchens.

The emotional appreciation of the poem also comes out. I have one sleeping slave whose paunch would do credit to an alderman. I have another who is carefully tucked up under a warm sofa blanket.

Writing.—Writing is just a form of drawing. Personally, I have no doubt that the Montessori system of teaching writing, in which the exercise comes after a number of exercises in drawing, is the right one.

Much wrong has been done to little children in the past by the attempt to teach them writing without enough preparatory exercise.

Little children—at least those brought up in a somewhat literary environment—seem to "write" spontaneously just as they "talk" spontaneously. Margaret began to "write" in her third year. At first her "writing" consisted just of a continuous up and down zig-zag; lately a curious change has taken place; loops and circles and other forms now appear: at a little distance some of her script might be taken for very bad writing.

I begin to wonder whether, if let alone, she would not in time with a very little help teach herself to write just as she taught herself to talk.

This notion is, I think, quite in accord with the child's own optimistic theory. The other day (fiftieth month), she said, "Am I big enough to write? Don't think I am big enough to write like ycu. Postman

wouldn't be able to read it. He would read o, o, o, and he would take it to Liverpool, and I want it to go to Newport."

Reading.—Reading in the Montessori system is taught along with writing, and this seems the correct method of approach.

I am, however, at present not concerned with methods of teaching, but with the little child's spontaneous reaction to those activities which play so large a part in our present civilisation.

In the fifteenth and sixteenth months Axel liked to "read" aloud, holding a newspaper or book before his face. It was just about the same time that Margaret also began to "read."

At a much later period some children will "read" aloud supplying their own words. Margaret has been known to do this, but only occasionally. It is difficult or impossible to induce her to "read aloud" now, probably because she knows she cannot do it properly.

As has been stated, Margaret learned the names of the letter forms early in her second year. She has been offered one or two opportunities to advance further into the mysteries of reading, but has not yet shown much disposition to avail herself of them.

Indications are not wanting, however, that when the time is ripe she will procure for herself the instruction of which she feels the need.

From the time she first began to "take notice" Margaret has shown an unaccountable partiality for books. When she began to move about, books seemed to attract her more than anything else. This was some time before her interest in pictures began.

In her fortieth and fiftieth months she once or twice commented on words having the same sound, but different meanings, *e.g.*, I *see* the *sea*; the chocolate shape is *set*, and the table is *set*.

About the same time some one taught the child that b, o, o, k, spelt book. Discovering this I gave her one or two examples of other words beginning with *b*. She soon showed she was not yet ready for this by inquiring "Does 'good' begin with b?"

In the child's forty-sixth month we were speaking of "round O." Margaret remarked, "There are different kinds of o's; there's O the letter and 'oh' that you say."

In her forty-fifth month she got the idea of saying the word when her mother spelt for her phonetically such words as c-a-t and b-a-t. A little later I was unsuccessful in obtaining from her a recognition of the word when she said the sounds herself; I urged her "Faster, faster," but she simply became louder and more emphatic and so did not run the sounds together.

About the same time the child was looking at a newspaper one day and spontaneously inquired, "What spells book? two o's and what at the beginning?" Quite recently (fiftieth month) the words *lap* and *collapse* with both of which she was familiar, had been used in her hearing. Spontaneously she remarked, "*Lap* just sounds like *collapse*. Does it spell with the same letters?"

This remark seems to indicate an increasing attention to sounds.

In reference to the present methods of teaching reading it is perhaps not out of place to say here that many children much older than Margaret have the same

difficulty as she has in running together the letter-sounds into words. Such children may learn to read more easily by the old irrational method of spelling the word aloud.

Lately I have been attempting to teach a little boy of eleven to read. His brain was injured at birth, and this has resulted in considerable paralysis of both legs and arms. His speech is somewhat affected also, and his intelligence is decidedly below normal. Owing to his physical health and other circumstances scarcely any attempt had before been made to teach him to read.

I taught him the letters, their names—some of which he knew—and the sounds they represented.

I then gradually taught him to read the names of several things of which I also gave him pictures.

I found that he learned to know these words quite well when I showed him the original cards on which they were printed; but he might not recognise the same words if he saw them in a book.

When he sounded the letters I found it was extremely rare for him to be able to pass from the more or less isolated sounds to the word.

More or less by chance I allowed him to begin to spell certain words, using the names of the letters. I found that such series as "Tee aitch ee The," "Tee oh To" readily remained in his mind; so that when he spelt aloud, the right word followed mechanically.

When I came to think of it, I saw that this fact is really in accord with what we know of the nature of the child's memory.

The mechanical memory for a motor series is extraordinarily strong. We see it in the way babies

will finish the lines of nursery rhymes when we give them the first word. We see it in the parrot way in which the number series, the alphabet, the days of the week are learned. We see it in our own ability to finish a word or a line of poetry if we only get the start.

Not long ago I taught Margaret the name "Sycamore." Next day I picked up a bunch of "keys" and asked her to what tree they belonged. She could not remember. "Syc—" said I. "A-more," she continued without hesitation.

"Parrot learning" is out of fashion at present; yet a certain amount of parrot learning in the region we are at present considering would not only be in accord with children's natural aptitudes, but would facilitate learning to spell, which in our confessedly irrational language is extremely difficult for any one taught to read too exclusively on the phonic or even the "look-and-say" system.

CHAPTER X

CONCLUSION

CHILDREN require to be trained and children require to be taught. These facts have always been recognised.

What has not always been recognised is that this teaching and training, if the best results are to be obtained, must be based on the laws of the child's own growth.

Brain Growth.—In training and teaching young children we must always remember that we are bringing about brain growth and development: and that we must allow time for these physical processes to take place. Much of a child's progress takes place when he appears to be doing nothing.

Professor James's saying that we learn to skate in summer and to swim in winter is nowhere so applicable as to the case of the child. He learns in the intervals between his lessons probably more than during the time of his lesson.

Speech Centres.—We have already seen that there is specialisation within the brain; that there is a centre for every sense, and that the main work of infancy is to link up those centres.

Probably the chief business of the child just passing out of babyhood is to make himself acquainted with his mother tongue. This involves the development of four

new brain centres. Part of the auditory centre specialises as a word-hearing centre, and in close connection with this there is formed a motor centre which directs the movements requisite for speech. At a later period part of the visual centre specialises as a word-seeing centre; and in connection with this also we find a motor centre which directs the movements of the hand required in the act of writing.

A baby is word-deaf for several months. He hears us speaking, but he distinguishes no words. The development of a word-hearing centre takes place gradually. The time required for this process differs very much in different children. In rare cases the centre may not develop at all, and then the child, though sensitive to all sounds, does not come to understand language.

Word-blindness, as a permanent condition, is more common than word-deafness. Most teachers who have had to deal with large numbers of children have met one or two who were extraordinarily slow in learning to read. In these children the word-seeing centre develops with great difficulty. If it does not develop at all, the child never learns to read. He continues to look at printed matter as a baby does, or as most of us look at Chinese; that is, it remains for him merely black marks on white paper. He sees no words.

Such a child can generally read figures readily, and may be quite good at Arithmetic. This is an important point in distinguishing the condition from feeble-mindedness.

Learning to Read.—Learning to read is not necessarily a long process. But these facts about

brain growth indicate that it must be spread over a considerable length of time.

It is on record that one of the Edgeworth children learned to read in eight hours, but these hours were made up of very short periods scattered probably over several months.

In teaching a child to read one may select the material according to either of two principles. One may take short words of two or three letters, put them together so as to form sentences, and present them to the child. Or one may direct the child's attention to words which appear in his environment, the name of the street he lives in, the name on the car in which he often rides, the "Please keep off the grass" placard in the Park, and so on. For very little children the second kind of material is probably the better, as the other tends almost inevitably in the direction of set lessons.

In Kindergarten schools one often sees the pegs of the little scholars distinguished by pictures pasted above each. At first sight one exclaims, "What a splendid plan. Of course these little people cannot read, and this device enables each to recognise his own peg." On second thoughts, however, one is inclined to ask whether an opportunity is not being missed. Were a card with the name of a child printed in bold letters on it placed above every peg, the appearance of certain words would become familiar, and in reading, as in many other matters, the first step is the real difficulty.

Some people think that children should not be taught to read until the age of six or seven. In the sense in which these people understand the word "taught," their opinion is probably sound.

But I am very sure that all children should have *opportunities* of learning to read long before they are six. And I am also sure that many of them will, if properly encouraged, teach themselves to read very much as in their earlier days they taught themselves to speak.

Of course they will need help. Without the example and assistance of others they cannot learn written language any more than they could have learned spoken language. In both cases the help given should be informal and brief, determined by opportunity and the child's interest.

There are three chief methods of teaching to read.

1. The Phonic Method, in which the child is taught to pronounce in quick succession the sounds of the letters making up a word. He thus hears himself drawling out the word, recognises it and repeats it correctly. This method has the advantage of enabling the learner to discover many unfamiliar words for himself. It is, however, unsuited to the numerous words which are not spelt according to their sound. Moreover, many children find it very hard to run the isolated sounds together so quickly as to enable them to make out the word.

2. The Look-and-Say Method, in which the child is simply told what each word is. By means of repetition he gradually comes to recognise words by himself. This method works directly towards the formation of the necessary word-seeing centre; but it does not teach the child any method of tackling entirely new words.

3. The Alphabetic Method, in which the child spells out the word, is told what it is, and expected to remember it. Logically there is nothing to be said in favour of

this method, but in practice, as already pointed out, it sometimes has good results.

The wise teacher will combine all three methods, being guided by the genius of the language and the pupil's ability and interest.

Number.—We do not know so much about brain development in connection with number as we do in connection with language. But there is some physiological evidence to show that here too there is specialisation on the part of the brain.

Psychological observations accord with the theory of a special number centre. Sometimes we find a remarkable number faculty in people of very low intelligence. Sometimes we find highly intelligent people remarkably weak in ability to comprehend and deal with number.

Moreover the differences that we find in children in the age at which interest in numbers and facility in dealing with them appear, seem to point in the same direction.

Number instruction should then be offered early. The foundations, as we have seen, should be laid in babyhood. The little child should be encouraged, but not urged, to count. As a rule he takes considerable interest in numbers. In an Edinburgh Free Kindergarten we found that number symbols were much more attractive to the children than letter symbols.

Practical Consequence.—If these things are so, if reading and number depend on the development of special centres in the brain, and if there are great individual differences in the rate of development, it follows that provision for this should be made in the

schools. At present the quick child must often have his progress retarded by the needless reiteration of principles he quite grasps. Even more harm is probably done to the abnormally slow child, for his brain is fatigued by too long or too frequent lessons. With such a child very short lessons with comparatively long intervals would probably be the best. In this region there is much room for experiment.

General Method.—It is now universally recognised that children can learn much by means of play. It does not take any great ingenuity to devise games that will teach number, or reading, or nature knowledge, or almost anything else. The desirability of the free use of this method does not nowadays require to be emphasised—at least with reference to little children.

The child, however, is in the main a serious person. He loves to search out causes, to discover similarities and differences. In our endeavours to teach him we should take full advantage of this spirit of scientific inquiry.

Now reading, when taught in the incidental, haphazard way which I have suggested, offers a splendid field for discoveries.

Thus in her fifty-second month Margaret would often spontaneously bring forth some such statement as, "*Mutton* begins with m, mmmmmmutton, and it ends with n, muttonnnnnnn."

It is true that on this particular occasion, finding her first essay favourably received, she somewhat discounted her attainment by continuing "And *but* begins with m—mmmmmmbut."

Here similarity of sound may have misled the little

thinker, but similar statements were made when no similarity of sound was present. New knowledge or new ability commonly does show itself in this spasmodic way. One moment it is certainly present; the next moment it is lost again. The child has only a glimpse of the truth; he sees in flashes and between times he makes statements, often suggested by something in the environment, which have little or no sense in them; which can be understood neither by himself nor by any one else.

Such lapses, such mistakes, are really of no importance. Very often they should be ignored. When they must be corrected, the correction should be made as unobtrusively as possible. No effort whatever should be made to make the child understand and accept the correction.

As the great Eastern teacher, Rabindranath Tagore, says, "The mistake is . . . to forget that a child is quick and mobile like a running stream; and that, in the case of such, any touch of imperfection need cause no great alarm, for the speed of the flow is itself the best corrective."

When a correction is gently insinuated, it mingles with the running stream; it acts on the child with the force of suggestion, and is accepted and assimilated. Whereas a noisy over-emphasised correction dams up the stream, arouses resistance, and may perpetuate the mistake it is designed to correct.

The general rule of method is, Trust the child's intelligence. Be ready to help, if help is wanted, but never rob the child of the joy of making his own discoveries. To keep the spirit of scientific curiosity alive in him is of far greater moment than to teach him anything whatever.

Recently I was watching a class of girls receiving a first lesson in woodwork. The teacher spent some time in drawing their attention to the various pieces of wood in the room; they realised that the long cuts were always made *with* the grain of the wood.

By analogy we may obtain the master rule of method in education. And that is, Work *with* the grain of the child. Knowledge that is given against the grain is a burden rather than a support, and tends to be discarded as soon as possible. Training given against the grain produces an imperfectly unified character.

In working with any material one cannot obtain the best results unless one knows intimately the nature of that material. This is the real reason why it is necessary that parents and teachers should study the psychology of the child. Only by such study can they find out the possibilities of the material with which it is their privilege to work.

We all have often grieved when we have seen little children with stunted, deformed, and crippled bodies due to the ignorance or apathy of their parents. Stunted, deformed, and crippled minds are even more common; but we do not grieve about them. They are so common that we accept them as normal. Our eyes are blind to the ideal.

We are beginning to realise how much may be done during the first years of life to secure that priceless boon —a healthy, well-developed body; we shall, I believe in the near future, realise also how much in these same years may and must be done if we are to secure the equally priceless boon—a healthy, well-developed mind.

INDEX